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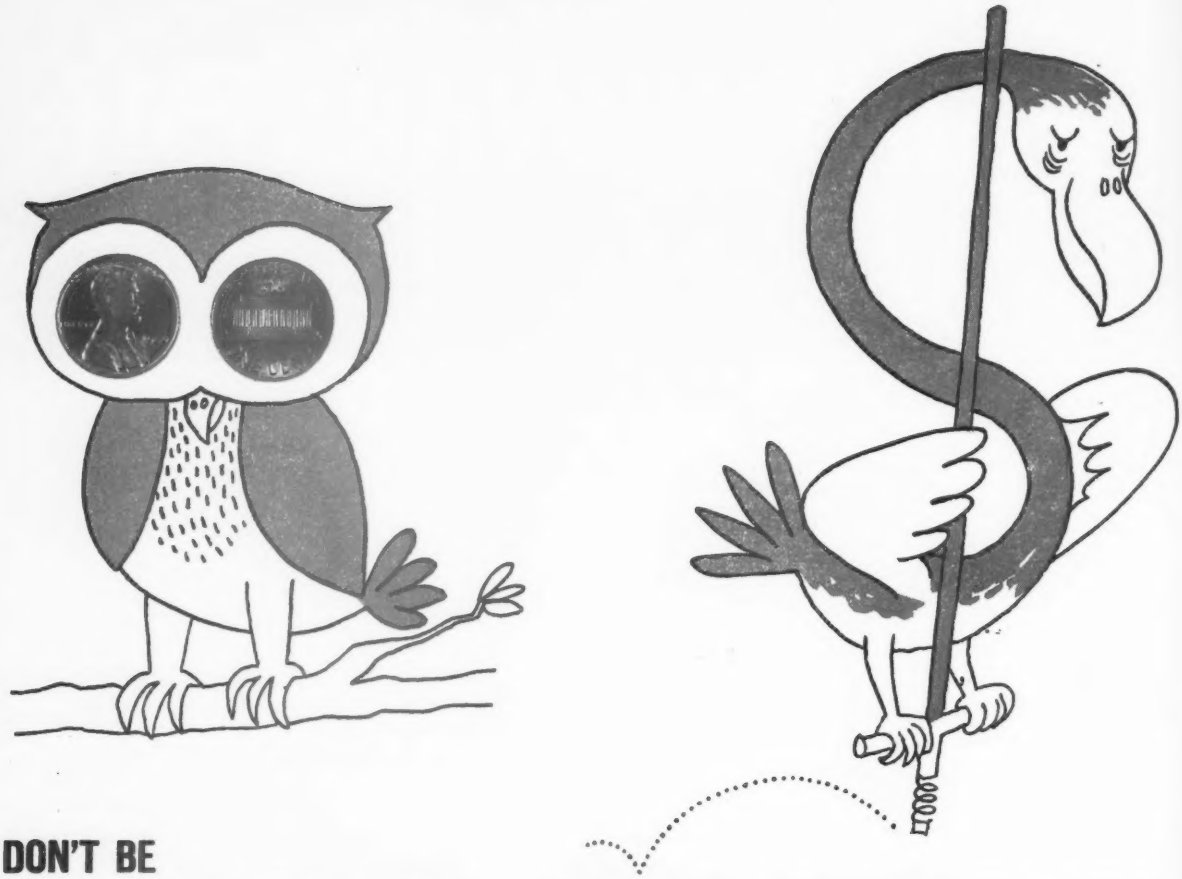
VOL. 49 JUNE, 1959 NO. 7

FEATURES

PRODUCTION

FOREIGN DEVELOPMENTS

DEPARTMENTS



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EDITORIAL COMMENT

A Significant Development

One of the more recent developments that looks promising to us is the use of epoxidized soybean oil as an intermediate or as an additive in various paint formulations.

When soybean oil was first introduced to the paint industry in the early thirties, it was found that merely substituting this new vegetable oil for linseed in lead-in-oil paints gave a product that looked promising but had one drawback—it would not dry no matter how much extra drier was added. Since this first attempt, much has been learned about the use of this versatile oil in paints; it was mainly through technical "know-how" that soybean oil found its way into an array of architectural and industrial paints over the last twenty years.

More recently, epoxidized soybean oils have attracted considerable attention among paint chemists. Work done by H. W. Chatfield in England shows that epoxidized soybean oil can be used advantageously in alkyd synthesis. One result of his research indicates that epoxidized oil can be used to reduce the acid number of alkyd vehicles without increasing the degree of polymerization in long cooks. Further work done by Chatfield showed that epoxidized soybean oil can be used as a partial replacement for glycerine in long oil linseed-phthalic alkyds resulting in coatings that air-dry faster, are tougher and have better adhesion. Also, a decrease in processing time was also observed with very long oil length alkyds yielding vehicles with improved color.

In the field of epoxy resins, epoxy ester coatings can be modified with epoxidized soybean oil. Besides reducing the cost of the coatings, this addition is said to improve gloss, and impart resistance to corrosion and gas checking.

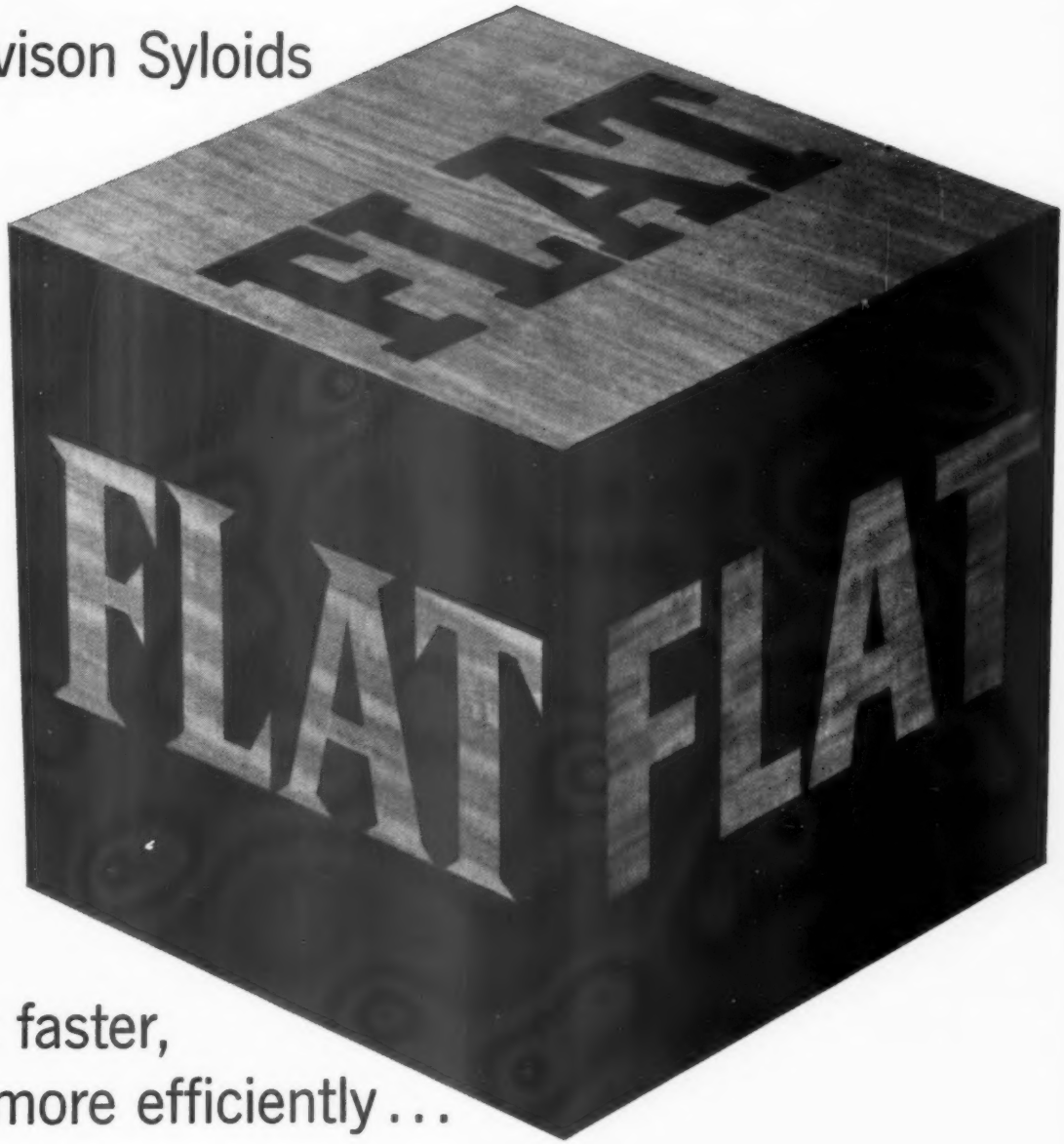
As an additive, epoxidized soybean oil contributes corrosion inhibiting properties to various paint systems. Chatfield observed that improved corrosion resistance resulted when epoxidized soybean oil was added to such coating resins as polyvinyl acetate-chloride copolymers, petroleum resins, chlorinated rubber, and melamine and urea resins. In formulations containing rust inhibiting pigments such as zinc chromate and red lead, it was possible to substitute iron oxide for some of the pigments without losing corrosion resistance if epoxidized soybean oil was included in the formulation.

Another approach in the use of epoxidized oils in protective coatings is to regard this material simply as a polyhydric alcohol. From this point of view one may react it with drying or semi-drying oil fatty acids to obtain synthetic drying oils. If equal parts of an epoxidized soybean oil is reacted with linseed oil, a reconstituted oil results which is claimed to dry more rapidly than linseed oil. The resulting films are said to have greater toughness, less residual tack, greater surface hardness, improved water resistance and less tendency to discolor. So far as speed of drying is concerned, the composition is said to dry at a rate almost comparable to that of dehydrated castor oil and the film resembles a varnish film more than an oil film.

Epoxidized soybean oil is also finding use in the formulation of unsaturated polyester resins. Preliminary indications are that the use of epoxidized soybean oil in this application leads to polyesters with greater resilience and improved adhesion to metal substrates.

While many of the above developments are still in the laboratory stage, their commercial realization cannot but help to spur greater use of this important vegetable oil by the coatings industry.

Davison Syloids



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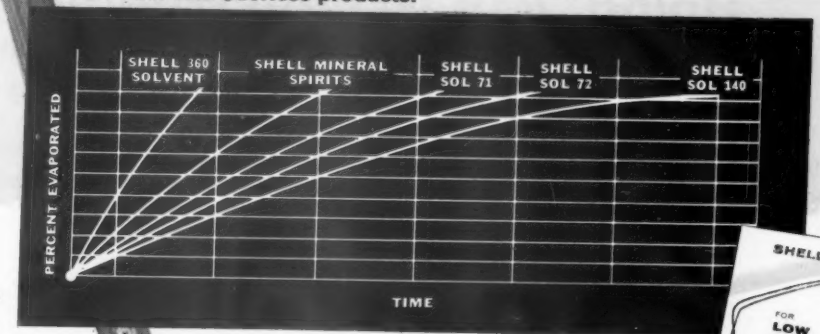

Typical properties of these Shell Solvents are contained in booklet shown. It will be mailed on request.

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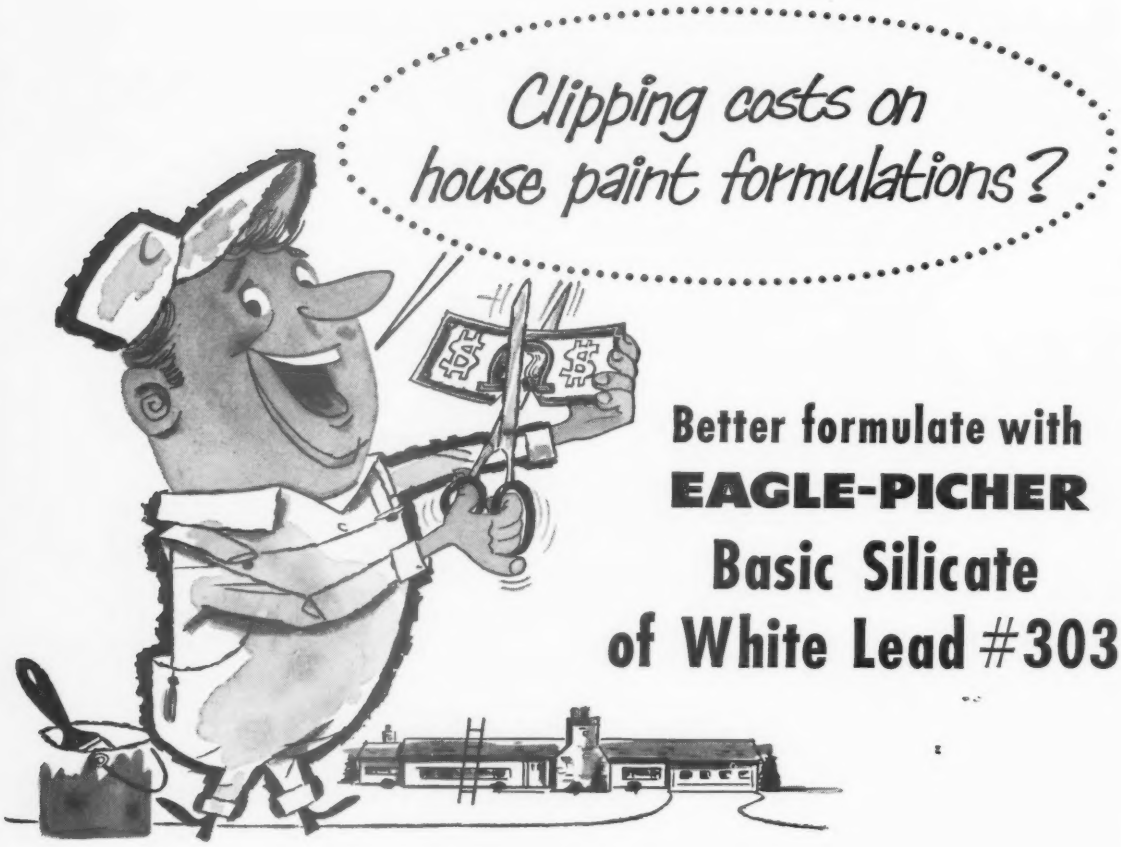

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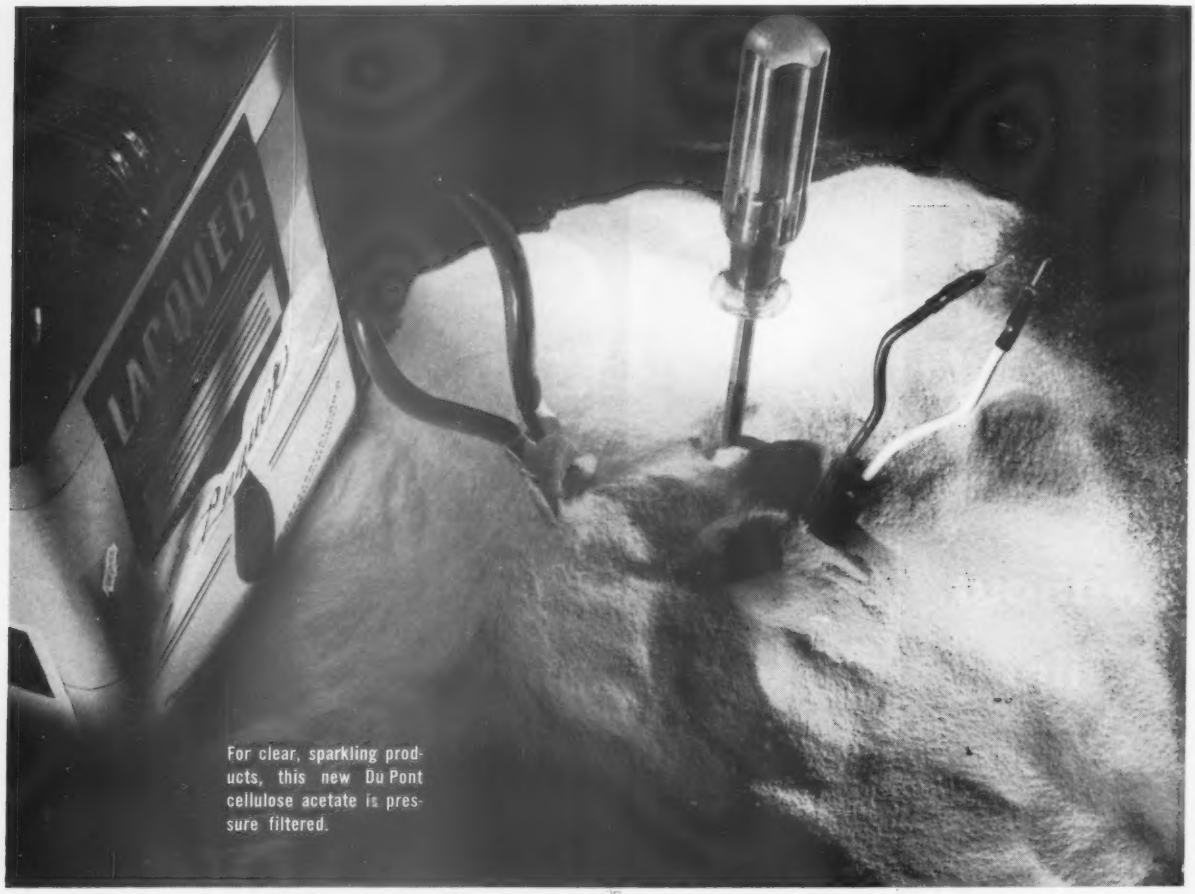

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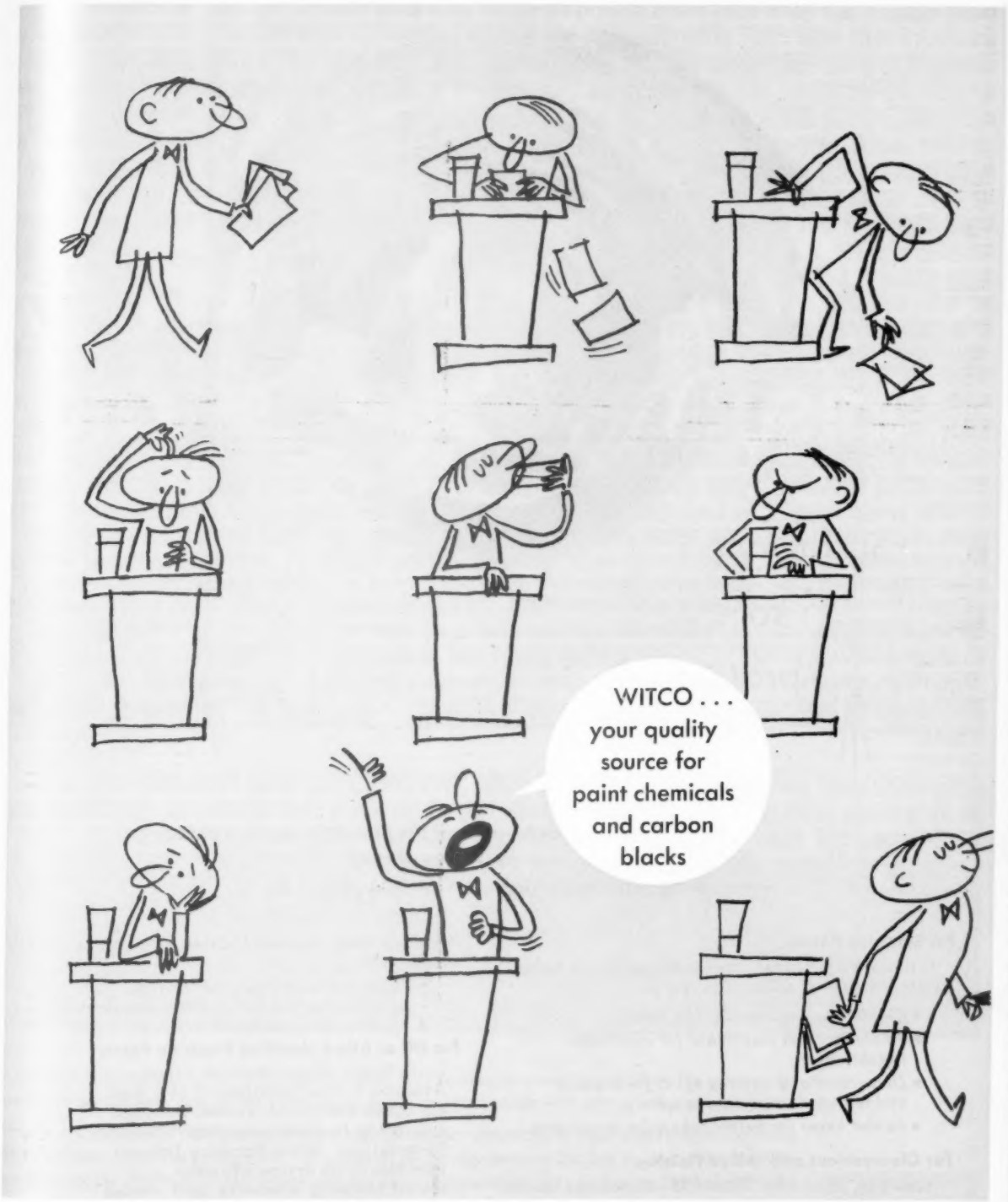

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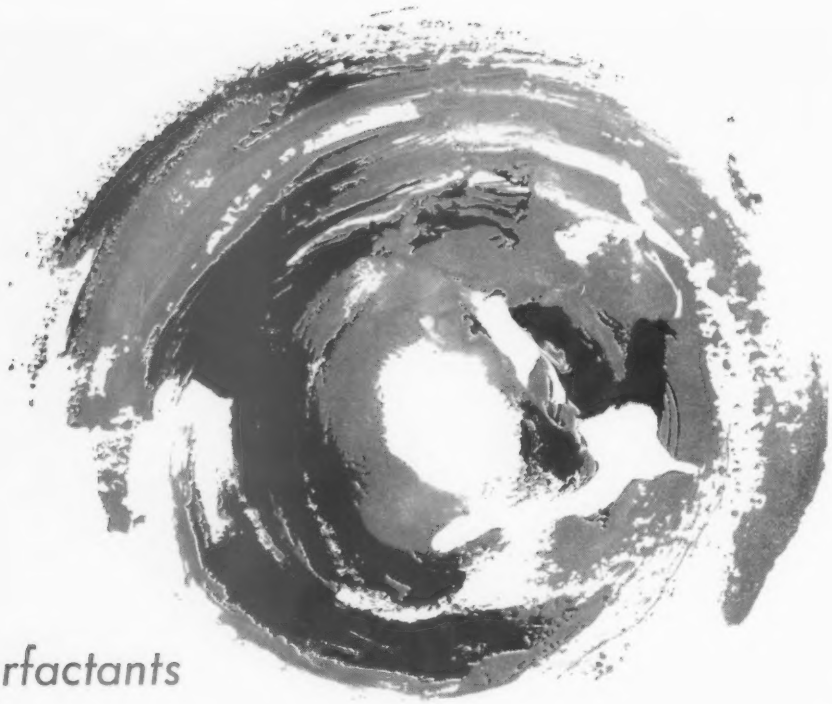

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the ADM kaleidoscope

Published by
Archer-Daniels-Midland company
May—June 1959

Now it's possible:

An Expanded Line of Products from a 'Streamlined' Inventory

by
J. C. BURKHOLDER
Manager, Synthetic Resins Department
Resin & Plastics Division, ADM

This is a familiar problem: The "conflict of interest" between the paint salesman and the paint production man.

Any good paint salesman likes to be able to meet most or all of his customer's paint needs. A complete line is one of the standard roads to greater sales volume.

The paint production man, however, looks at the other side of the coin. To him, an expanding or mushrooming line of products entails some complications. An expanded line frequently means a greater raw materials inventory. It often means increased space requirements and handling costs. As the production man sees it, the bigger the line, the higher the production costs.

How do you solve this problem? At ADM, we can help you in two ways.

First, we make it possible for you to "streamline" your resin inventory. We provide you with *versatile* resins that will do a good job in more than one paint product, enabling you to use a smaller resin inventory for a greater number of paints.

Secondly, we have simplified the job of selecting the right resins for your needs. This issue of Kaleidoscope, the fourth in a series of *Resin Finders*, covers Miscellaneous Trade Sales Finishes. Subjects covered in other *Resin Finder* issues are Industrial Finishes, Exterior Finishes, and Interior Finishes. Copies of previous issues are still available.

When completed, the full set of *Resin Finders* will contain all the special features and characteristics of the ADM family of resins, with suggested uses for each resin. From this handy tabulation, you can select a "leaner" resin inventory that will give you the necessary range of flexibility needed in formulating a full line of products.

All of the resins offered in the *Resin Finders* are *job-rated*. Each has been thoroughly proven by our experienced and well-equipped research staff—and by the customers who are using them.

Make use of the ADM *Resin Finders*. You can save money by using a smaller line of extremely versatile resins, from a single source. ADM's nation-wide manufacturing, warehousing and shipping facilities put these resins at your door. Your ADM salesman, backed by the facilities of our research department, is ready to help you with your resin selection problems. Don't hesitate to call on him. And now check over our latest *Resin Finder* on the next two pages.

RESIN FINDER.... for

BARN PAINTS

	Special Features	Application Properties	Durability	Versatility
Varco 1000	Lowest cost barn paints.	Excellent flow and gloss. Fair brushability unless modified with other oils.	Fair alone—very good if modified with ⅓ to ½ linseed oil.	Lowest cost shop coats and dark colored enamels.
Dryfol Z_6 Dryfol B-50	For intermediate-to-low cost, non-penetrating or one-coat barn paints. Good dry and color. Use B-50 for increased flow and decreased penetration. Use the Z_6 for decreased flow.	Good brushability with broad range of flow and gloss properties when blended in various proportions.	Good in red or other dark colors.	Low-cost, versatile vehicles. Dryfol Z_6 also used for aluminum paints and checking oil for varnishes and printing inks. Dryfol B-50 for primer sealers and flats, including Government Specifications TT-P-47a, TT-P-51d and TT-P-56b.
Var 70 Admerol 75-M	Very good dry. Pass 100% Kauri reduction with normal driers and thinners. Very good ratio of hardness to flexibility.	Good brushability. Usual modification with linseed oil for barn paints further improves application properties.	Very good durability. Recommended modification with raw linseed or Ardol for higher solids and easier application.	Recommended for trim paints, stain and blister resistant house paints on new wood, aluminum paints and for Government Specifications TT-V-81b and TT-V-121b (spar varnish type material).
Linogel Soyagel	Dry faster and with greater flexibility than linseed oil. Impart excellent flow. Very good grinding and dispersing aids.	Very good brushability when properly blended with limpid oils.	Excellent durability. Use as bodied oils to improve flow, dry and non-penetration.	Generally used as modifiers for grinding aid, puffing, improved flow. Especially recommended in house paint primers.
Alinco Ardol Raw Linseed Oil	Alincos and Ardols are used with any of the above vehicles to increase solids, improve durability and improve lapping and other application properties. These oils can be used as sole vehicle for very good quality barn paints.			

EXTERIOR REDWOOD AND CEDAR FINISHES

Zymol	Good dry and very good flexibility. Very light colored. Slow viscosity reduction.	Very good when thinned to 60% solids with mineral spirits or similar slow solvents.	Excellent. Fails by gradual erosion. Does not crack, check or flake. Light pigmentation with iron oxide or umber further increases durability	A very fast kettle oil. Used as replacement oil for dehydrated castor oil and partial replacement for chinawood oil.

INTERIOR FLOOR PAINTS

Admerol 351 Var 70 Admerol 75-M	All impart excellent water resistance and speed of dry. Admerol 351 is for hardness, alkali resistance and abrasion resistance. Var 70 or Admerol 75-M as modifiers to get desired flexibility.	Very good. Easy brushing, excellent flow and gloss.	Excellent durability to abrasion for interior use. Fair-good for exterior. Admerol 351 alone not recommended for exterior. Var 70 and Admerol 75-M good for durability but lose gloss and fade faster than pure alkyds.	Very versatile, can be used in many Fed Specs such as TT-V-121c; TT-V-71d and TT-V-81b. All nterior enamels and some industrial applications such as primers, drum enamels and shop coats.
Arolon 110	For emulsion or water-thinned concrete floor paints.	Excellent. Easy brushing, good flow. Gloss in 20-40 range on 60° gloss meter.	Abrasion resistance and water resistance very good. Exterior durability not proven to date.	Interior emulsion paints of all types. Exterior emulsion paints for concrete or stucco.

Miscellaneous Trade Sales Finishes

ALUMINUM PAINTS

	Special Features	Leafing Properties	Durability	Versatility
Var 70 Admerol 75-M	Economical vehicles with good dry and color. Kauri flexibility approximately 100% depending on percentage of solids and driers used.	Somewhat slower leafing than some vehicles but very positive and complete. Excellent leafing stability—samples observed thru 5 years.	Excellent durability in aluminum finishes.	Black chassis finishes and low-cost, dark-colored enamels. Barn paints, Admerol 75-M recommended for TT-V-81b. Consider as a long oil spar varnish.
Dryfol Z_3 Dryfol Z_6	Lower cost than Var 70 or Admerol 75-M. Good dry with Kauri flexibility exceeding 100%.	Somewhat slower leafing than some vehicles but very positive and complete. Excellent leafing stability—samples observed thru 5 years.	Very good, but not quite as durable as Var 70 or Admerol 75-M.	Low-cost bodied oils of unusual versatility. (See Barn Paints for other uses.)
Admerol 351	Excellent dry and hardness. Passes approximately 20% Kauri reduction. Used in fast drying enamel-type aluminum paints.	Somewhat slower leafing than some vehicles but very positive and complete. Excellent leafing stability—samples observed thru 5 years.	Very good durability on metal surfaces. Fair durability on wood.	Recommended for floor paints and varnishes. Improves hardness and abrasion resistance of alkyds used for porch and floor paints.
OKO Linseed Oils	Light-colored, vacuum-bodied linseed oil. Must be used with hard resin or one of the above vehicles for improved dry and hardness in most applications.	Extremely good leafing and leaf retention.	Excellent durability.	Also recommended for varnishes.

MAINTENANCE PAINTS—SHOP COATS AND PRIMERS

	Special Features	Salt Spray Resistance	Water Resistance	Recoatability
Aroplaz X663	Non-lifting to lacquer. Excellent hardness and early recoatability. Meets MIL-E-74a.	Excellent. Easily withstands 500 hours in 5% salt spray in shopcoat formulation.	Very good. Withstands 300 hours immersion without blistering or other sign of failure.	Excellent. Can be recoated with all type top coats. Holdout is very good.
Admerol 351	Low cost, high gloss primers.	Excellent in same category as X663 in this property.	Very good. Withstands 300 hours water immersion.	Cannot be recoated with lacquers or other topcoats containing strong solvents. Holdout not as good.
Varco 1000	Suggested for lowest cost shop coat and allied applications.			
Arolon 304	Water-soluble vehicle for primers and shop coats. Can be applied to damp surfaces. Non-flammable. Suggested for air dry and baking primers.	Very good. Withstands 300 hours or more exposure to 5% salt spray. Use of approximately 0.4 lbs./gal. of strontium chromate will further increase salt spray resistance.	Excellent. Sheds water very well. Not affected in any way after 300 hours immersion.	Good, can be recoated with lacquers, and other topcoats containing strong solvents.
Arolon 110	Water emulsion. Use alone or in combination with Arolon 304 in air dry primers and shop coats.	When used in pigmentation with up to .4 lbs./gal. of strontium chromate, salt spray is good.	Water immersion only fair after 24 hours air dry. Good after 1 week air dry.	Good. Can be recoated with any topcoats including N/C lacquers.

Many of you know Bill Gove. He's been on our Northwoods Paint Sales Workshop Program three years in a row and has been a featured speaker at many trade conventions.

In 1953 The National Sales Executives picked him "Salesman of the Year" and the St. Paul Advertising Club in 1954 named him "Sales Promotion Man of the Year."

Bill will present, via KALEIDOSCOPE, his "Easy to Buy From" series.

Bill's a pretty practical guy. He believes that if we become easier to live with—we just automatically become easier to buy from.

"Easy to buy from"

By Bill Gove

Every school boy knows the old saying, "You can lead a horse to water, but can't *make* him drink."

As grown-ups, we, too, subscribe to the theory that the only way we can make horses (and customers) drink is by *making 'em want to.*

Yet sales literature and popular literature today is filled with all the ways we can *force* people to do what we want.

We're told to flatter our customers. Or, to use the latest terminology—"to EGO-FEED 'em." We're told we must be more agreeable—have better human relations—develop a dynamic sales personality. All this so we can do a better job of "manipulating" people as if they were puppets and we held the strings.

Are these the methods the real "pro" uses? I don't think so!

He knows that if he tried this kind of foolishness, he'd be out on his ear in nothing flat. He knows that his customers can spot a "phony" personality a mile away.

No, the star salesman doesn't count on tricks, gimmicks, or slick techniques. He usually sells—just as he likes to be sold when he's buying something—in a natural, easy, grown-up way.

And the latest findings of scientists in human behavior tell us that this is the right way to sell.

Dr. S. I. Hayakawa, semanticist from San Francisco State College, says, "All salesmen must avoid the belief that they think differently and are smarter than the most inexperienced or youngest of their customers.

"As Americans, all our thinking is shaped by basically similar schools, churches, magazines, newspapers, television programs. We all think and act basically from the same beliefs."

So he adds: "What strikes us as nonsense is likely to strike our customers as nonsense. What strikes us as important and significant is likely to strike our customers the same way."

Hayakawa advocates that as salesmen we should look into our *hearts* for the effective, persuasive presentations that will make our customers REALLY WANT TO BUY—AND FROM US.

I called on a purchasing agent friend of mine a short time ago, and we got to talking about this thing. He said: "In this business, I suppose a salesman usually finds it hard to dig up something new to talk about every time he calls on me. So this puts more emphasis on the kind of person he is than it does on his products.

"If he's a 'phony'—an insincere flatterer—a personality boy—well, he can wear out his welcome mighty quick.

"It occurs to me that most of the salesmen I work best with are guys that I'd be happy to have along on a fishing or hunting trip. I don't know how this applies to other lines of business, but it does to mine.

"I like the guy who comes in, swaps a couple of ideas with me. Yes, and I don't even mind if he tries *real hard* to sell me something he believes will help me. After all, that's his job."

As Hayakawa said, maybe we wouldn't be too far off if we'd look inside ourselves for the more effective ways to get people to want to buy . . . to make us *easy to buy from.*

Technically Speaking . . .

FLOOR FILM FACTS. "Price, performance, and ADM Copolymers". . . all very important words in any conversation about floor finishes. Though ADMEROL 351-M and ADMEROL 75-M have been doing a fine job in floor enamels, varnishes, and sealers for a number of years, we recently decided to recheck these tried and true products. The results were so reassuring that we would be proud to send them on to you. At the same time ask us how AROLON 110 looks in floor paints. We do not hesitate to say it looks good and are willing to back up the statement with some data and a formula.

WARING BLENDOR* FOR LABORATORY PAINT MAKING. This high shearing-power device lately has found its way onto more and more laboratory bench tops. Now it is being used at our Sales Service Laboratory for dispersing pigments in paint. Although the ADM Laboratory wasn't the first to think of this, perhaps you would like to benefit by our experience. Ask us about it.

**Product of Waring Products Corp., New York, N.Y.*

KERR DEFINOMETER. One of many pieces of equipment in the ADM Laboratory is this device for measuring the reflective properties of films. It checks the reflective or definitive factor which is related to gloss but not measurable with the glossmeter. It has application in those situations where high gloss readings are not consistent with the actual appearance of the film. Involved is the projection of graduated letters and figures upon the test panel. From a photograph of the panel reflection, definition is determined by looking for the last readable line of diminishing letters. W. Raymond Kerr describes his device in ASTM Bulletin 191, July 1953. However, we will be glad to tell you what we know about it in an illustrated Technical Data Sheet.

GEN-FLO TEST DATA—LOT NO. 1189—MN 58

TEST	SURFACE TENSION	Ph	% COAGULUM	VISCOSITY	FREEZE THAW	TOTAL SOLIDS CONTENT	MONOMER CHARGE RATIO	RESIDUAL STYRENE	SPECIFIC GRAVITY	MECHANICAL STABILITY	PARTICLE SIZE	
O. K.	✓	✓✓ ✓✓	✓	✓	✓	✓✓	✓	✓	✓	✓✓	✓	✓
FAIL												
INITIAL	JK	CM Lmk Ma JH.V.	SK	ME	BV	HP QP	DZ	DH	SP	JR MS	QK	CHA
DATE	10/15	10/15 10/15 10/15 10/15	10/15	10/15	10/15	10/15 10/15	10/15	10/15	10/15	10/15 10/15	10/15	10/15

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FACTS YOU SHOULD KNOW ABOUT GEN-FLO

Available in shipments tailored to your operation, Gen-Flo offers these physical characteristics:

Viscosity—cps.	21
Residual styrene %	0.03
Odor	Extremely mild
Mechanical stability %	0.03
Film specs	Good
Stabilization System	Balanced

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CHEMICAL DIVISION
AKRON, OHIO

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● On hot days the sun seems much bigger. It makes its presence felt. It can get too hot to work . . . too hot to play . . . even too hot to sleep. On poorly painted and unprotected wooden surfaces, the sun acts like a hot air furnace. It sucks moisture through the siding leaving timber tinder-dry. With old paint, the sun causes paint blisters and cracks, opening the building's "skin" to erosion by wind and rain. But take a home protected by quality paint . . . paint made with Minnesota Linseed Oil base. Time has proved that linseed oil paints can withstand blistering and cracking best of all. Why not find out for yourself why Minnesota brand linseed oil is best for purity, for quality control and dependability?

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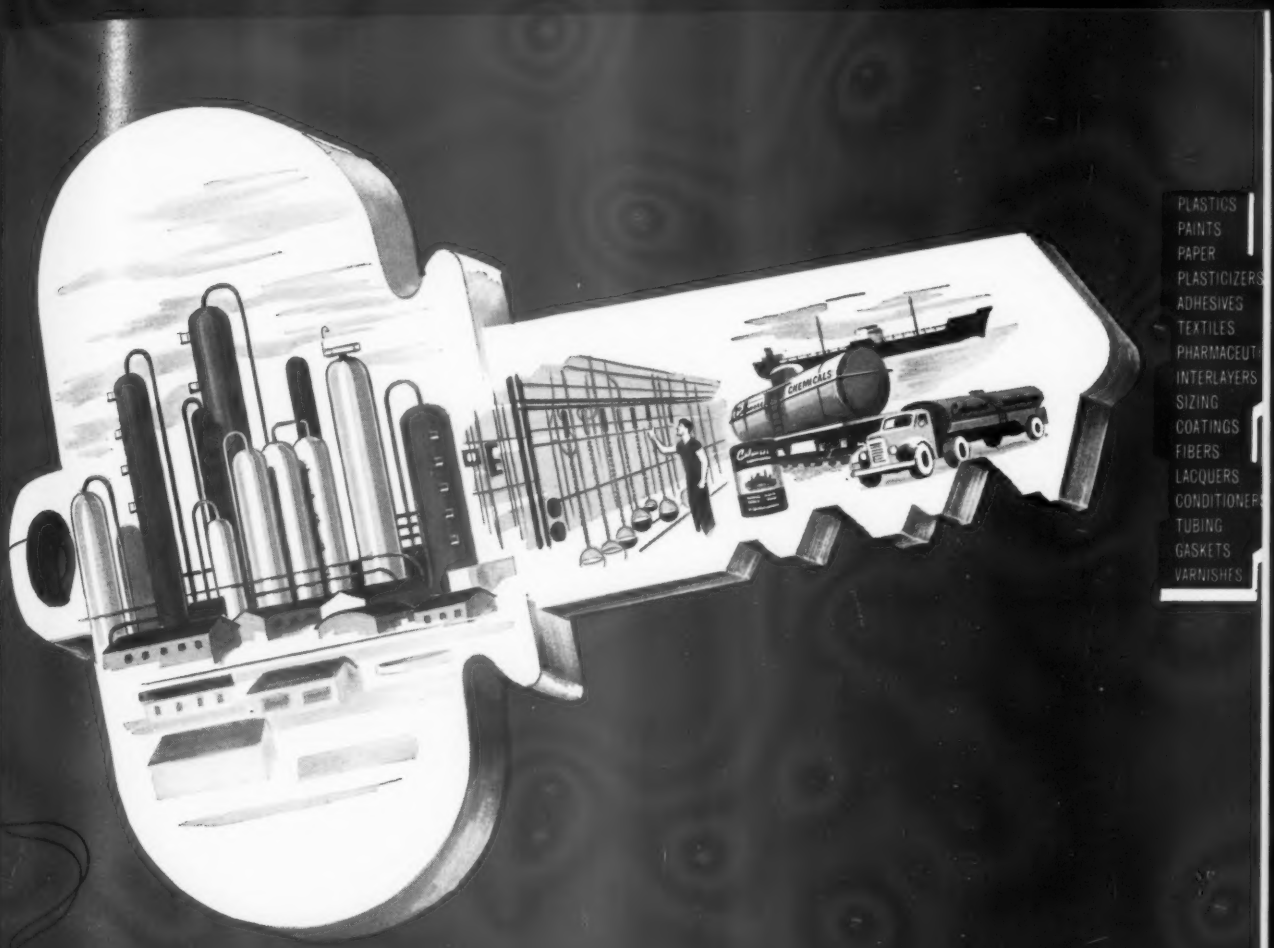

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We make the raw materials for vinyl acetate and combine these materials to form the monomer. We exercise control of all the processes basic to the finished product. Result: you benefit when you buy high-quality $CH_3CO_2 \cdot CH{:}CH_2$ monomer from the Celanese Corporation of America. With a reliable monomeric product as a start, you can take the next steps with confidence:

Polymerize Celanese vinyl acetate to produce adhesives, binders, coatings, water-based paints, primers and sealers.

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PROBLEMS AND SOLUTIONS
IN LACQUER TECHNOLOGY...

one of a series of advertisements designed to acquaint formulators with the properties and applications of the various types of cellulose acetate butyrate.

Which type of cellulose acetate butyrate would you select for this coating problem?

PROBLEM:

To formulate a premium lacquer for coating paper-back book jackets

ANALYSIS: To give maximum visual appeal to books on display, the lacquer must produce a coating that is clear, colorless and high in gloss. Secondly, because pocket books are exposed to sunlight in store windows for extended periods of time, they must be coated with a lacquer that will not discolor upon aging. Normally, pocket books are subjected to considerable abuse in handling, too; consequently, the lacquer must be tough, flexible and scuff-resistant. Good adhesion to inked surfaces is another requirement. The lacquer must not block at temperatures up to 300°F. And, finally, it must be easy to formulate and adaptable to conventional finishing techniques.

SOLUTION: In order to attain a coating with the required high blocking resistance, it is necessary to incorporate a cross-linking thermosetting resin. Excellent resins for this purpose are based on urea formaldehyde. These resins, when properly catalyzed, cure at the temperatures and times used by paper coaters, yet lacquers containing them exhibit good pot life—3 to 4 days.

Of the four types of butyrate film formers available, let's rule out EAB 171; for, being low in butyryl content, it is least compatible with urea formaldehyde resins. On the other hand, EAB 500, the highest butyryl content ester (50%), is not the answer either as it produces relatively soft films.

Our choice lies, therefore, between EAB 272 (butyryl content: 27%) and EAB 381 (butyryl content: 38%), as both of these types produce films that meet the requirements of this lacquer application for flexibility, toughness, scuff resistance and adhesion.

EAB 381 has greater tolerance for various lacquer solvents and permits formulation of lacquers with higher solids content than does EAB 272. This is especially true of the low-viscosity grade, EAB 381-½, commonly known as Half-Second Butyrate. For this application it appears to be the most suitable type of cellulose acetate butyrate.

In common with all butyrate film formers, Half-Second Butyrate produces clear, colorless, high gloss coatings that do not discolor or yellow upon aging or exposure to sunlight.

Eastman cellulose acetate butyrate is free-flowing and non-hazardous in storage. It is shipped as a fine dry powder in 50-pound multi-wall paper bags. Your request for help on a specific formulation problem is welcomed by your Eastman representative.

Authoritative, detailed information on the various types of cellulose acetate butyrate, including their chemical composition, physical properties and their use as film formers in metal lacquers, wood finishes, and textile and paper coatings is contained in Eastman's 72-page booklet, "Cellulose Acetate Butyrate for Protective Coatings." It is a comprehensive, complete source file of fundamental information, reporting the results of years of work in formulating, testing and evaluating coatings based on cellulose acetate butyrate. Make sure a copy is always at hand by writing to the address below for yours.

Eastman CHEMICAL PRODUCTS, INC.

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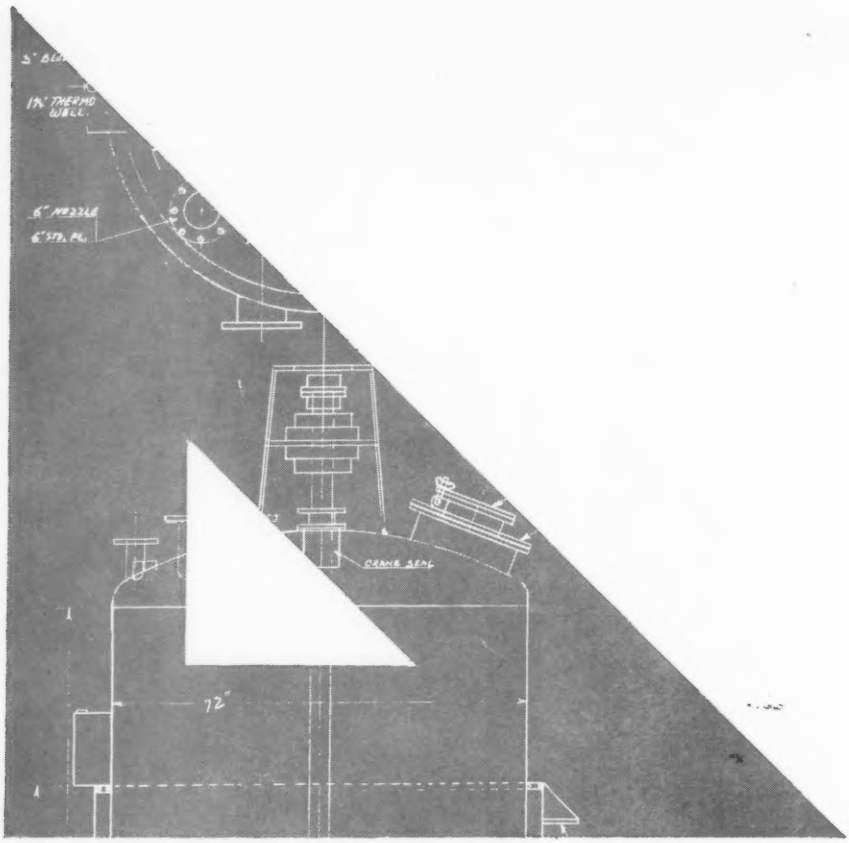
SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Framingham, Massachusetts; Greensboro, N. C.; Houston; New York; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



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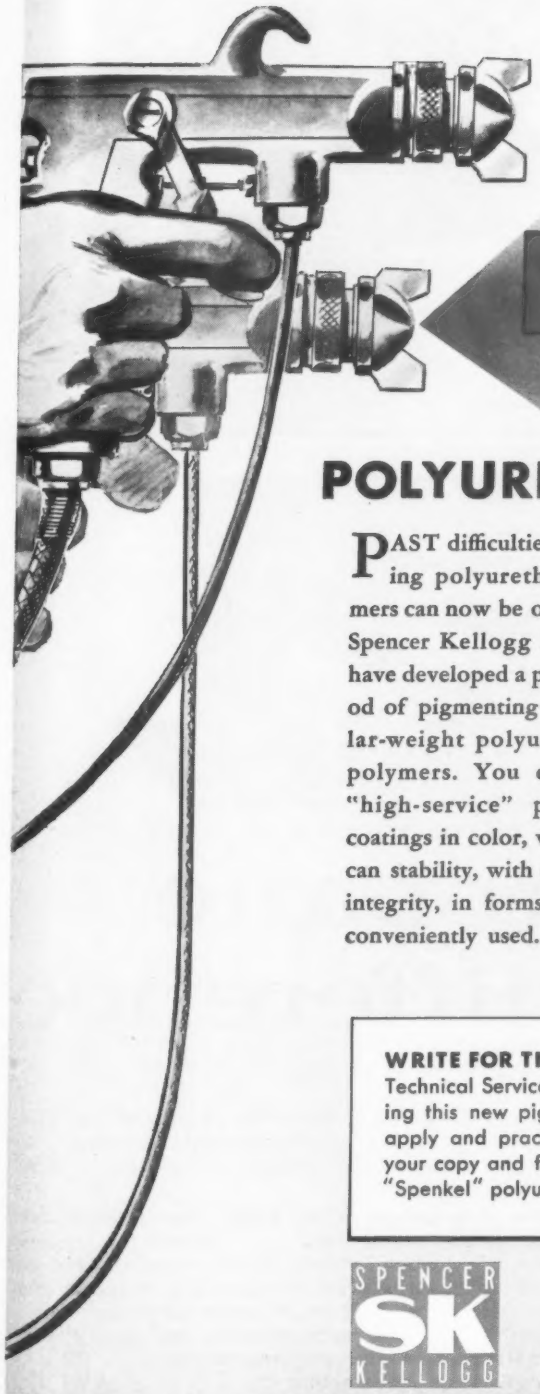

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Higher gloss and better application properties will accompany improved viscosity stability.

This method specifically deals with Spenkels P18-50X and P93-80X—both urethane pre-polymers that exhibit high chemical and wear resistance. Spenkel P18 is very hard. Spenkel P93 is extremely flexible. Both are tough. *NOW* they can be pigmented.

WRITE FOR THIS BULLETIN. Spencer Kellogg and Sons, Inc. Technical Service Department have prepared a bulletin describing this new pigmentation method, showing it to be simple to apply and practicable for the average paint plant. Write for your copy and for the bulletins describing the Spencer Kellogg "Spenkel" polyurethane intermediates.

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Please send me the bulletin on your "Slurry Grind" method of pigmenting polyurethane intermediates.

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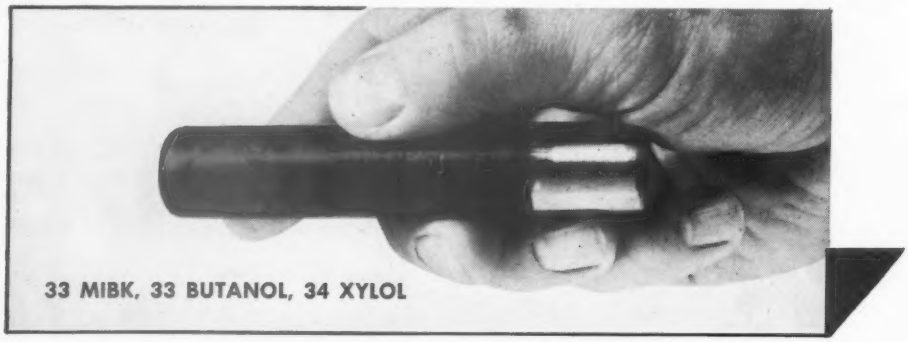

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With 2-NP, you get

- **Greater Chemical Resistance**
- **Uniform Evaporation Rate**
- **Minimum Pinholing and Cratering**
- **Thicker Films**

Greater Chemical Resistance. In the test illustrated here, ¾-inch steel bars were given a resin coating 6 to 8 mils thick. They were dried one week, and then exposed to 30% Nitric Acid. The unretouched photographs are striking evidence of the improvement contributed by 2-NP.

Uniform Evaporation Rate. The evaporation rate of 2-Nitropropane is ideal for spray systems, contributing favorable flow properties and excellent blush resistance with improved drying times.

Other Advantages. Films using 2-Nitropropane show marked reduction of water vapor permeability, excellent spray characteristics, and less tendency to crawl. Also, substantially thicker films can be obtained at no loss of other desirable features. 2-NP can be used to advantage in both polyamide or amine catalyzed systems, and systems employing urea-formaldehyde or phenolic cross-linking agents.

Write for Technical Data Sheet No. 23C.

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LOOKING AHEAD:

Here is a rundown of special features which are scheduled in the forthcoming issues of PAINT & VARNISH PRODUCTION.

July - The use of Dowtherm for heat transfer in the processing of varnishes and alkyd resins will be featured. This system permits uniform heating at high temperatures but with low pressure.

* * *

August - Solvent-resistant polyvinyl alcohol coatings with good weathering properties will be discussed. Using water as the principal solvent, these coatings are formulated to form acetals that resist solution. The effects of various ingredients on the coating properties will also be presented.

* * *

September - Control of pollutants from paint and varnish manufacturing operations will be featured in our production section. Sources of atmospheric pollution and methods for controlling atmospheric emission will be covered in detail.

* * *

October - Our October Special Convention issue will carry a comprehensive article on the use of material handling in paint manufacture. This exclusive feature will consist of specially prepared articles covering conveyors, fork trucks, hoists and overhead equipment, warehousing, hand equipment and pallets, and pumps.

Cordially,

Tony Errico

Anthony Errico
EDITOR

THE USE OF CORROSION INHIBITING SUBSTANCES IN POLY (VINYL ACETATE) METAL PRIMERS

By
J. C. Baatz*

The presence of water in emulsion based paints has limited their use on metal surfaces. Some efforts have been directed at reducing corrosion in the paint container before the paint itself was used; however, the work under discussion here was concerned with corrosion prevention by a dry paint film. The work was performed with a series of four corrosion inhibiting pigments all containing a chromate portion, and five corrosion inhibiting additives. With respect to a normal emulsion based paint formulation, a definite improvement in corrosion prevention on surfaces normally quite susceptible to corrosion was attained using an emulsion based binder and a chromate pigment or an emulsion based binder and an inhibiting additive. This could be observed both when the pigment and additive were used separately and when a combination of pigment and additive was used. Of the additives and pigments investigated, the most significant improvement was obtained with sodium nitrite and zinc yellow, respectively. A combination of these two, together with a surface tension depressant to facilitate wetting of the metal surface, provided the maximum in corrosion prevention in the series of tests under discussion.

THE use of all classes of emulsion based on water thinned paints has grown at a very rapid rate in recent years. One area which is only now being covered is the use of emulsion based paints on surfaces which are subject to corrosion. The weakness in this area has been due to the relatively hydrophilic character of such materials. This, of course, may be expected to lead to a high order of conductivity in the paint film and subsequently to an acceleration of the electrochemical processes involved in corrosion.

There appear to be at least two possible approaches to the problem; in some way changing the character of the emulsion film so as to make it hydrophobic, or at least much less hydrophilic, or adding to the paint itself something which will tend to counteract the inherent affinity of the emulsion film for water. It is quite probable that a combination of these two methods will be necessary to solve the problem to everyone's satisfaction.

*Research Dept., Shawinigan Resins Corp., Springfield, Mass.

This paper was presented at the Meeting of the American Chemical Society in Chicago, September, 1958. It was given in the Division of Paint, Plastics, and Printing Ink Chemistry as part of the Symposium on the Mechanisms of Anticorrosive Primers, Allen L. Alexander, Presiding.

The work described here was concerned only with the second approach mentioned above and dealt primarily with paints based on poly (vinyl acetate). The moisture vapor permeability of clear films and paints based on this type of emulsion has been reported to be as high as or higher than the permeability of film forming substances in the same class, e.g., styrene butadiene and acrylic. (1,2)

Two types of corrosion inhibiting substances were investigated, soluble or dispersible substances which act as inhibitors alone and presumably serve no other function in the paint, and pigments which have corrosion retarding qualities. Five of the former were evaluated and three were found to function as expected; one, $NaNO_2$, was found to be superior. Admittedly, this was a small number to have considered, but the purpose was to determine whether compounds of

Paint #	1	2	3	4	5	6	7	8
Rutile TiO_2 (RA-50)	7.9	7.9					15.5	
Zinc yellow (1425)					17.6			19.0
Zinc tetroxy chromate (1345)		12.6	20.4					
Strontium chromate (X-2396)				19.8				
Basic lead silico chromate (M-50)						20.8		
Calcium carbonate (Atomite)	60.0	60.0	60.0	60.0	60.0	60.0		43.0
Calcium Metasilicate (Wollastonite-P-1)	19.3	19.3	19.3	19.3	19.3	19.3		
Magnesium silicate (Asbestine 3X)	9.0							
Clay (ASP-400)							77.6	43.0
Surfynol TG						0.4	0.4	0.4
Tergitol Anionic 4								1.3
Tamol 731 (25%)	1.2		1.2	1.2	1.2	1.3	1.2	
Pluronic L-61	0.2	0.2	0.2	0.2	0.2			
Aerosol OT (75%)		0.4						
Methocel HG (400 cps - 3%)			29.3	29.3	29.3			35.0
Burtonite #77 (4%)							37.5	
Water	128.0	125.5	141.6	141.6	138.4	127.0	83.6	89.0
PVAc emulsion 39574-A	161.5							
PVAc emulsion 39574-B		161.5						
PVAc emulsion 39574-C			151.0	151.0	151.0	151.0		
PVAc emulsion 39574-D							158.6	
PVAc emulsion 59574-E								185.2
$NaNO_2$ (45% sol'n)								9.2

Paint #	9-13 (incl.)	16	17	18
Zinc yellow (1425)	0-19.0	33.3	28.7	28.7
Red oxide (R-2200)	28.1-0			
Calcium carbonate (Atomite)	43.0	75.0	64.8	64.8
Clay ASP-400)	43.0	75.0	64.8	64.8
Surfynol TG	0.4	0.7	1.2	0.6
Tergitol Anionic 4	1.3	2.3	4.0	2.0
Triton CF-10 (50%)				6.7
Burtonite #77 (4%)		68.9	59.4	59.4
Water	116.4	162.0	139.8	139.8
PVAc emulsion 39574-E		324.6		
Rhoplex AC-33			299.1	
Dow Latex X-2566				280.5
Gelva Emulsion TS-30	162.7			
$NaNo_2$ (45% soln.)	9.1	16.4	14.1	14.1
Cyclodex Water Dispersible Cobalt				1.3
Dibutyl phthalate	9.0			
Hexylene glycol	12.0			

↑

Formulations

← **referred to in text.**

this nature could do a job.

Again, there are many pigments which have been shown to possess corrosion retarding properties. The purpose of this work was to determine whether a representative type of such a pigment could perform satisfactorily in emulsion paints. Consequently, only chromates were investigated, their corrosion inhibiting qualities having been well demonstrated in other systems. (3,4) Furthermore, since a range of chromates of varying solubilities in water was available, it was thought that this might provide additional information or leads, since the emulsion film retains some sensitivity to water after drying.

Test Methods and Procedure

The experimental work was performed with laboratory batches of poly(vinyl acetate) emulsion paints. The general method of preparation followed a standard pattern; the thorough mixing of a pigment slurry, the preparation of a paint base consisting mainly of emulsion, the addition of the paint base to the slurry, and passage of the paint through a Morehouse Mill to obtain the final grind. All the corrosion inhibitors, such as $NaNO_2$, were added at this point.

The panels used for all the tests were cold rolled steel, gage 20. These panels were cleaned by wiping off any excess oil, scrubbing with detergent and stainless steel pads, and thorough rinsing with tap water. The criterion of cleanliness was the ability to hold a continuous film of water.

Application in most cases was by spray gun, DeVilbiss, Type TGA, Series 502, a suction feed type with a No. 90 tip, using 20-25 pounds of air in the line. The films which were baked were applied in the following series of steps; a wet film, approximately one mil, sprayed and flash dried, the panel cooled, another one mil wet film sprayed, and the two coat system baked. This would result in a total dry film thickness of approximately one mil, ready for testing or for a topcoat.

Panels which were coated by brush received two coats of primer and two coats of topcoat allowing at least an hour between coats and twenty-four hours after the application of the final coat before testing.

Tests

Immersion tests were performed in Pyrex beakers. A coated panel was immersed in a 5% solution of NaCl at room temperature for a specified time. A vertical scratch was inscribed through the film before testing.

Salt fog testing was carried out in a Type CAR-1 cabinet of Industrial Filter & Pump Manufacturing Company. Temperature and salt fog concentration were constant at 100°F and 5%, respectively. Coated panels, with two vertical scratches, were suspended in the cabinet by means of glass tubing.

Accelerated weathering resistance was evaluated in an Atlas Weatherometer, Model XWR, cam #7.

Evaluation

Panels exposed to immersion and salt fog were rated for the extent of corrosion at the scratch and the extent of corrosion over the remaining area. It was possible to obtain a result where no corrosion at all occurred at the scratch. Such a result was rated as excellent. Where the corrosion confined to this scratch area extended over most of the length of the scratch and where the underfilm creep was considerable, the result was rated poor. Between these extremes, where creep was not so obvious and there were areas of very little corrosion, the result was designated as fair. (Figure 1).

This rating system is subjective to a great extent, and the usual objections to such a system apply here. One reason for the necessity of using such a system is illustrated in Figure 2, where some ratings for overall corrosion are shown. Again, it was possible to have panels where, considering only areas apart from the scratch, no evidence of corrosion existed. This was termed an excellent result. Ratings declined as the effect of corrosion became more widespread. This effect, especially for those panels where overall corrosion resistance was very poor, tended to obscure corrosion extent at the scratch.

Another factor tending to obscure the ratings both for scratch and overall corrosion is shown in Figure 3. The tendency for corrosion to be extremely severe at the top edge of the panel and at the support hole very often re-

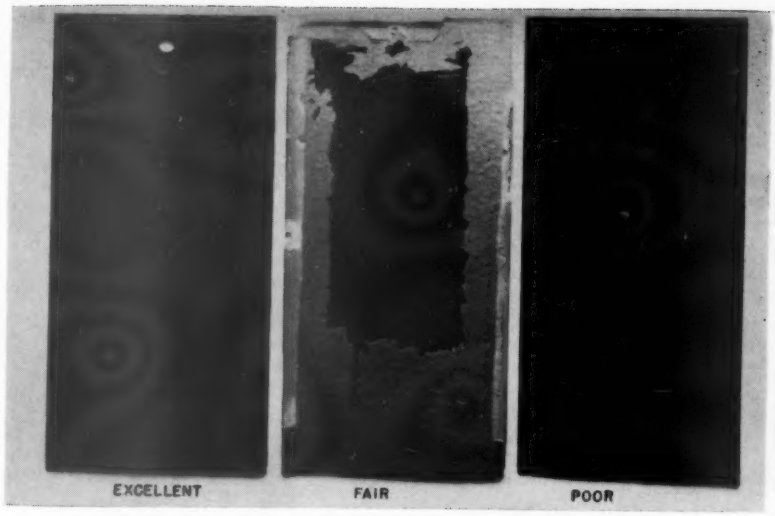

Figure 1. Examples of scratch corrosion rating.

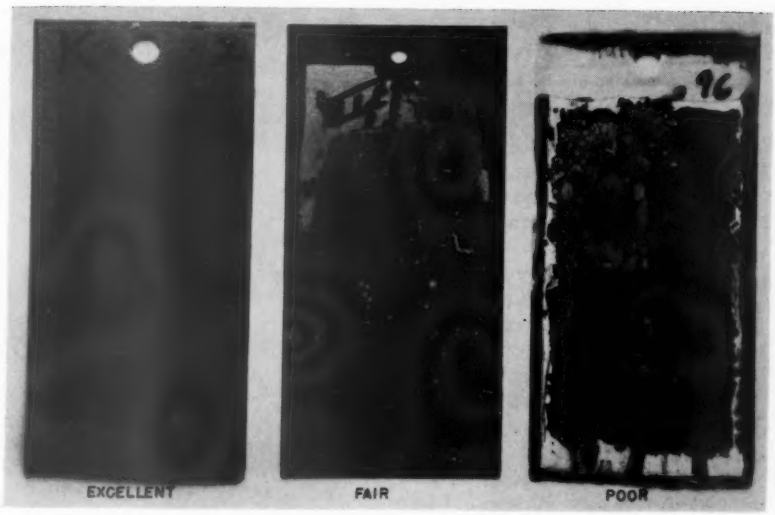

Figure 2. Examples of overall corrosion rating.

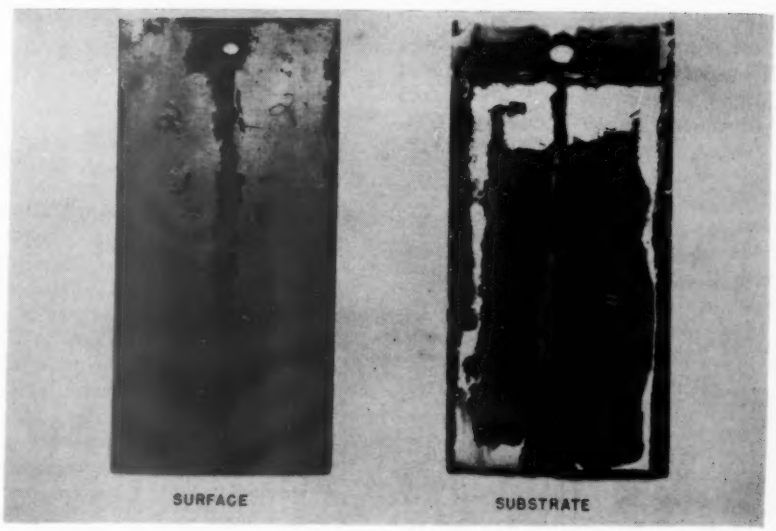

Figure 3. Example of rundown effect.

Run	Paint	Extender	Prime Pigment Type	% of Total Pigment by Weight	Test Used Type	Test Used Hours	Result Scratch	Result Overall	Remarks
1	1	1	Rutile TiO_2	10	Immersion	48	V. Poor	Poor	
			Rutile TiO_2	8					
2	2	2	Basic Zinc Cromate	12	Immersion	72	V. Poor	Fair	
3	3	3	Basic Zinc Chromate	20	Salt Fog	260	Fair	Poor	
4	4	2	Strontium Chromate	20	"	260	V. Good	Fair	
5	5	2	Zinc Yellow	18	"	260	Fair	Fair	
6	6	2	Basic Lead Silico Chromate	21	"	480	Fair	Fair	
7	3	2	Basic Zinc Chromate	20	"	480	Good	Fair	Alkyd topcoat
8	4	2	Strontium Chromate	20	"	480	Good	Fair	Alkyd topcoat
9	5	2	Zinc yellow	18	"	480	Good	Good	Alkyd topcoat
10	7	3	Rutile TiO_2	17	"	480	Poor	V.Poor	
11	5	2	Zinc yellow	18	"	480	V. Good	Good	Surface tension depressant added

Table I. Effect of chromate pigments in thermosetting poly (vinyl acetate) paints.

sulted in a more or less continual flow of rusty water over the test surface. This resulted, in all cases, in a similar effect on the substrate. When it was obvious that corrosion of the substrate was due to this effect alone, it was ignored.

Experimental Data and Discussion

The laboratory programs involving the evaluation of corrosion inhibitors and passivating pigments were carried out simultaneously. For purposes of clarity the results will be presented here in two sections, the first showing what was learned of the effect of chromate pigments and the second dealing with the effect of corrosion inhibiting additives.

Section 1

Table I shows formulation variables and results of tests where the test vehicles were all thermosetting systems. The composition of the paints remained relatively constant. The base emulsion was a poly(vinyl acetate). The paint films were cured at 350°F for 15 minutes. Three extender systems were used as shown below.

#1
$CaCO_3$ (Atomite)
Mica, water ground (Asbestine 3X)
Wollastonite (P-1)

#2
$CaCO_3$ (Atomite)
Wollastonite (P-1)

#3
Clay (ASP-400)

Non-volatile material and pigment volume concentration were constant at 50% and 30%, respectively.

(1000 Hours Exposure in Weatherometer)

Run	Paint	% Iron Oxide by Volume	% Zinc Yellow by Volume	Results Topcoat	Results Substrate
12	9	100	0	checking; heavy chalking.	Severe corrosion
13	10	75	25	Very slight yellow stain.	Not affected
14	11	50	50	Very slight yellow stain.	" "
15	12	25	75	Very slight yellow stain.	" "
16	13	0	100	Very slight yellow stain.	" "

Table II. Effect of zinc yellow in air dried poly (vinyl acetate) metal primer

The results shown in Table I indicate that chromate pigments are fairly effective as corrosion preventatives when used in poly (vinyl acetate) systems. Runs 1 and 10 with no chromate were very poor. The addition of a chromate in Run 2 indicated that a noticeable improvement was possible. Runs 3, 4, 5 and 6 were attempts to assess the value of different chromate pigments. (7, 8 and 9 correspond to 3, 4 and 5 but topcoated with an alkyd enamel.) The results were such as to indicate that a very definite gain was obtained from the presence of chromate pigments in the films. Among the four chromates evaluated, it was not too easy to single out any very significant differences. Zinc tetroxy chromate appeared to be the least effective; zinc yellow and basic lead silico chromate appeared to be slightly more effective than strontium chromate. Basic lead silico chromate was not included in the series of topcoated panels since, in the system being used, it exhibited a tendency toward severe hard settling.

It was hoped that some correlation between the amount of available chromate as measured by solubility in water and the corrosion resistance of the primers might appear in this series. As a matter of fact, zinc yellow, strontium chromate and zinc tetroxy chromate provided decreasing levels of protection corresponding to their decreasing solubility in water, although the differences in level of protection were very much less distinct than the differences in solubility. Basic lead silico chromate, on the other hand, despite the very low solubility of the chromate portion, provided a very good level of protection.

The greatest difficulty appeared to be an inability of the paints to wet the metal surface uniformly. What corrosion did occur had a very spotty, non-uniform character. When a surface tension depressant was added to Paint 5, the paint containing zinc yellow, the improvement in corrosion resistance was marked. This result is shown as Run 11.

Further evidence of the beneficial

Run	Paint	Inhibitor Type	% of Total Paint by Weight	Length of Test (hours)	Result Scratch	Result Overall	Remarks
17	3	$NaNO_2$	0.5	260	Fair	Excellent	
18	3	K_2CrO_4	0.5	260	Poor	Fair	
19	3	VPI-220	0.5	260	Fair	Fair	
20	3	VPI-260	0.5	260	Poor	Poor	
21	3	2, 4-dichlorophenoxy-acetic acid (Na salt)	0.5	260	Poor	Fair	
22	3	$NaNO_2$	0.5	480	Good	Excellent	Alkyd topcoat
23	3	K_2CrO_4	0.5	480	Good	Fair	Alkyd topcoat
24	3	VPI-220	0.5	480	Good	Fair	Alkyd topcoat
25	3	VPI-260	0.5	480	Good	Fair	Alkyd topcoat
26	3	2, 4-dichlorophenoxy-acetic acid (Na salt)	0.5	480	Good	Fair	Alkyd topcoat
27	5	$NaNO_2$	1.0	480	Excellent	V. Good	Surface tension depressant added
28	5	$NaNO_2$	5.0	480	Good	Good	Surface tension depressant added

Table III. Effect of corrosion inhibitors in thermosetting poly (vinyl acetate) primers. (Exposure in salt fog cabinet.)

effect that can be obtained with a chromate pigment is shown in Table II. Here were five air drying paints identical in composition, except for the amount of red iron oxide and zinc yellow. In the table, the relative volumes of these two-pigments are shown for each paint as a percentage of the total volume of both. $NaNO_2$ was present in each paint in an amount totaling one percent by weight based on the total paint. The paints were applied by brush and half of each panel was topcoated with a poly (vinyl acetate) exterior white. The test consisted of 1000 hours of Weatherometer exposure. Run 12, no zinc yellow present, showed signs of corrosion, as evidenced by rust staining in the white topcoat, almost immediately. There was some slight staining noticed in the topcoat, Run 13, at approximately 500 hours, although there was no evidence of any corrosion on the substrate at the conclusion of the test. Corrosion of the substrate was quite severe for Run 12, despite the presence of the $NaNO_2$. No other sample showed any sign of corrosion on the substrate.

There was also an appreciable difference in the durability of the topcoats, the advantage once again being with those used over the primers containing zinc yellow. In Run 12 the topcoat checked very badly and chalking was greatly accelerated.

A common fault of the paints containing the chromate pigment was a tendency, especially during the early stages of the test, to impart tint to the topcoat. In later samples using a less soluble type of chromate pigment, for instance zinc tetroxy chromate, the corrosion inhibiting qualities did not suffer at all and staining by the soluble chromate was almost entirely eliminated, as shown in the Weatherometer.

Section 2

The use of corrosion inhibitors in water thinned paints, and in various closed systems with water present, has been quite widespread in the past (5,6). Many soluble inhibitors have been used, their main purpose being to lessen or eliminate the problem of corrosion in the paint can before the paint itself is actually used. Much success and some failure have accrued to these efforts.

The main goal of this work was to determine the ability of corrosion inhibitors to aid in retarding corrosion on a metal surface after the paint film applied.

Table III shows the corrosion inhibitors that were used, and the results that were obtained in salt fog exposure tests, using the same thermosetting systems as were used in Table I. Paint 3 was chosen as the vehicle to which the inhibitors would be added. The chromate pigment in this case was zinc tetroxy chromate. The level of inhibitor was arbitrarily set at 0.5% on the total paint. Both topcoated and untopcoated panels were tested. Two of the inhibitors, VPI-260 and K_2CrO_4, produced primers with less corrosion resistance than was obtained with no inhibitor at all. The phenoxy-acetic acid salt (7) and VPI-2200 (cyclohexylamine nitrite derative) provided a moderate improvement. $NaNO_2$ provided a remarkable improvement, particularly with respect to corrosion in areas other than at the scratch. In Run 27 the prime pigment used was zinc yellow and the level of $NaNO_2$ was increased to one percent based on the total. The results were excellent, there being little evidence of corrosion after 480 hours of salt fog exposure. Increasing the level of $NaNO_2$ to 5% in Run 28 resulted in a lessening of the corrosion inhibiting properties of the film.

A direct comparison can be made between three different paints, with and without $NaNO_2$, as shown in Table IV. In all three cases, with no chromate, with basic lead silico chromate, and with zinc yellow, the effect of the $NaNO_2$ was

Paint #	Prime Pigments	Inhibitors	Result Scratch	Result Overall
7	Rutile TiO_2	$NaNO_2$	Fair	Good
7	Rutile TiO_2	None	Poor	V. Poor
6	Basic Lead Silico Chromate	$NaNO_2$	Excellent	Good
6	Basic Lead Silico Chromate	None	Fair	Fair
8	Zinc yellow	$NaNO_2$	Excellent	V.Good
8	Zinc yellow	None	V.Good	Good

Table IV. Comparison of some paints with and without $NaNO_2$. (Exposure in salt fog cabinet—480 hours.) No topcoat.

(Exposure in Salt Fog Cabinet – 500 Hours)
No Topcoat

Paint #	Latex Type	Chromate Pigment	Inhibiting Additive	Bake Min.	Bake Temp. (F°)	Result Scratch	Result Overall
14*							
(8)	Acrylic	None	None	30	300	—	V. poor
15*							
(9)	SBD	Zinc yellow	None	30	325	Poor	Good
16	PVAc	Zinc yellow	$NaNO_2$	15	350	Excellent	Fair
17	Acrylic	Zinc yellow	$NaNO_2$	30	300	Excellent	Fair
18	SBD	Zinc yellow	$NaNO_2$	30	325	Excellent	Fair

*Formulation as published by supplier

Table V. Comparison of some standard and experimental primers with different emulsion types.

quite significant.

The solubility of the corrosion inhibiting substances used in the primer formulations was a question to be considered. If the environment in which the primer was exposed could in some way leach these substances from the film, then it would seem that protection against corrosion would not be indefinite. A set of three panels protected with two coats of a poly(vinyl acetate), zinc tetroxy chromate, air drying primer and two coats of a conventional poly(vinyl acetate) exterior paint, the primer containing $NaNO_2$ at the one percent level, was exposed in a humidity cabinet operating at 100% R.H., 100°F. The first signs of corrosion were not apparent up to 1100 to 1200 hours, there was no serious evidence of failure up to 1400 hours of continuous exposure. Failure after this point was passed was rapid. All of which may indicate that, in fact, there is a gradual leaching action up to some critical point after which the corrosion protection drops off sharply.

An interesting set of results was obtained in attempting to transfer the corrosion inhibiting pigment—corrosion inhibiting additive system to other emulsions. A polyacrylic and a styrene-butadiene emulsion, both of which had been recommended by the suppliers as suitable vehicles for thermosetting metal primers, were tested in a series which also included the poly (vinyl acetate) emulsion which was used in most of the work described above. Complete formulations were suggested by both suppliers (8, 9); that for the polyacrylic emulsion included neither a chromate pigment nor an inhibitor, that for the styrene-butadiene emulsion did include a chromate pigment but did not include an inhibitor. The primers were exposed in the salt fog cabinet for 500 hours and the results are shown in Table V.

The suggested polyacrylic formulation proveded very nearly no corrosion resistance, the suggested styrene-butadiene formulation gave good overall protection, but the scratch corrosion was poor. The poly(vinyl acetate) formulation provided excellent corrosion resistance at the scratch, fair protection overall. The most interesting feature arose when the polyacrylic and styrene-butadiene emulsions were used in the formulation developed for the poly(vinyl-acetate) emulsion, i.e., with a chromate pigment and an inhibitor. Overall protection by the acrylic emulsion was vastly improved, overall protection by the styrene–butadiene emulsion was slightly less. Corrosion at the scratch was reduced very considerably for both. This was despite the fact that the poly(vinyl acetate) formulation was not entirely suitable for the other two, resulting in slight pigment flocculation and possibly some resin precipitation.

Conclusions

1. Little, if any, corrosion resistance can be had from the best poly(vinyl acetate) emulsion systems now available, using a conventional pigmentation such as titanium dioxide plus extenders.

2. Chromate pigments will upgrade the resistance of poly(vinyl acetate) systems to corrosion.

3. Soluble or dispersible inhibitors can upgrade the resistance of dry poly(vinyl acetate) paint films. Of those observed, $NaNO_2$ has been found to be most efficient.

4. Complete wetting of the substrate is essential if adequate corrosion resistance is to be obtained with a poly (vinyl acetate) paint.

5. The higest level of corrosion resistance that we have obtained at present with poly(vinyl acetate) paints requires that an inhibitor, an inhibiting pigment, and a surface tension depressant be present in the paint.

6. Undoubtedly, further modifications of the systems, tried, both as to types and amounts of ingredients and in terms of other emulsion systems and other paint components, will result in extended improvements. However, it is clear that even within the framework of existing emulsion paint technology, systems with significantly useful levels of corrosion resistance can be formulated.

Sources of Raw Materials Used

Pigments	
Titanium dioxide, RA-50	Titanium Pigments Corporation
Zinc yellow, 1425	Reichold Chemicals, Inc.
Zinc tetroxy chromate, 1345	Mineral Pigments Corp.
Strontium chromate, X2396	Imperial Paper & Color Corp.
Basic lead silico chromate, M-50	National Lead Co.
Red iron oxide, R-2200	C. K. Williams Co.
Atomite	Thompson, Weinman & Company
ASP-400	Minerals & Chemicals Corp. of America
Asbestine 3X	International Talc Co.
Wollastonite P-1	Godfrey L. Cabot
Emulsions	
Gelva Emulsions	Shawinigan Resins Corporation
Rhoplex AC-33	Rohm & Haas Company
Experimental Latex X-2566	Dow Chemical Co.
Miscellaneous	
Surfynol TG	Air Reduction Chemical Co.
Tergitol Anionic 4	Union Carbide Chemical Co.
Triton CF-10, Tamol 731	Rohm & Haas Company
Pluronic L-61	Wyandotte Chemical Co.
Aerosol OT	American Cyanamid Co.
Sodium Nitrite, U. S. P.	Solvay Process Division, Allied Chemical & Dye Corp.
Burtonite #77	The Burtonite Co.
Methocel	Dow Chemical Co.
Cyclodex Water Dispersible Cobalt	Nuodex Products Company
Hexylene glycol	Shell Chemical Co.
Dibutyl phthalate	Monsanto Chemical Company
VPI-220, VPI-260	Shell Chemical Co.
Potassium chromate (A. C. S.)	J. T. Baker Chemical Co.
2,4-dichlorophenoxyacetic acid (Na salt)	Monsanto Chemical Co.

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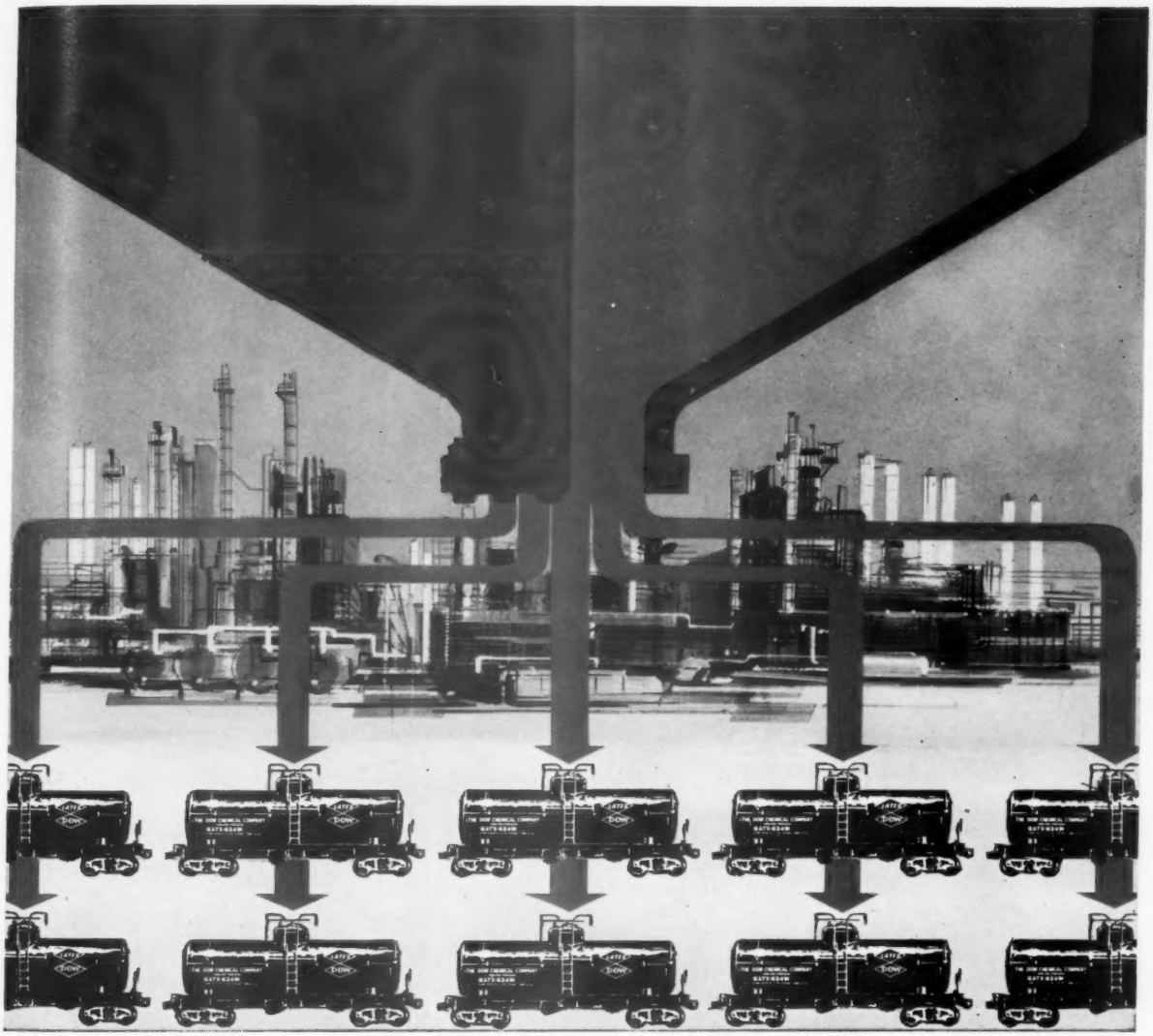

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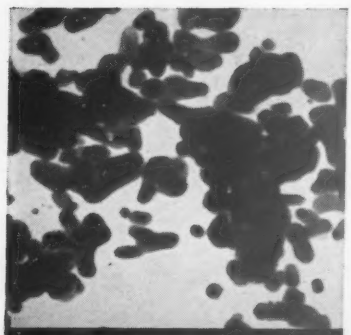

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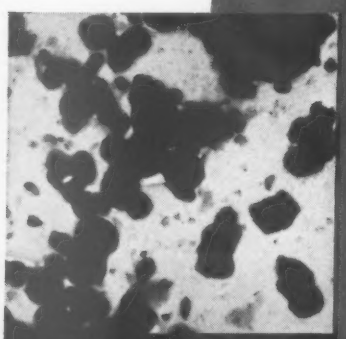

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SILICONE ADDITIVES FOR PAINT

By
R. C. Hedlund
K. R. Meath

Silicones are well known for their excellent heat resistance and weathering properties. Many of these properties can be incorporated into clear and pigmented finishes by the use of silicones additives.

Two types of silicone additives, resins and fluids, are used by paint formulators. The resin additives are used to increase the heat stability of organic coatings, and to improve their resistance to water and weathering. Silicone fluid additives are used to improve leveling and flowout, to reduce floating, to increase mar resistance and to produce hammer finishes. Some silicone fluids are also effective defoamers, and have been used to improve wetting properties of coatings that are to be applied to surfaces on which traces of silicone fluid may be present.

Chemically, silicones are polymeric materials having organic groups attached to a quartz-like molecular structure. They differ from organic polymers as they are polymers based on inorganic silicon-oxygen linkages rather than a carbon-carbon linkage. Silicone polymers, whether fluid or resinous, have a number of basic properties in common. These are: stability over wide temperature spans—from high temperatures to extremely low temperatures; resistance to moisture, chemicals, and oxidation; and good dielectric properties. Most other properties will vary depending on chemical structure, thus making each product suitable for certain specific applications.

The authors are associated with the Protective Coatings Section, Product Engineering Laboratories, Dow Corning Corp., Midland, Mich.

Silicone Resins in Coatings

Coatings containing silicone resins are prepared in the same manner and with the same equipment as organic coatings. The silicone resin can be blended with the organic resin before processing or added to the paint after milling. Formulations can be tailored to air-dry or to be cured by baking. The resins are compatible with a wide variety of organic polymers, and, therefore, can be used in lacquers, enamels and oil based paints. Table I shows the compatibility of a silicone blending resin with several common organic resins.

Heat Resistance

The outstanding heat stability of pure (100%) silicone resins make them useful additives in baking enamels. For example, the addition of one to five percent (by weight) of a silicone resin[1] to an alkyd-urea baking enamel has been used to obtain greater gloss and color retention on overbaking. Larger amounts of resins,[2] 25 to 75%, have been used with non-drying alkyds and acrylics to obtain coatings which have excellent color and gloss retention at 400°F. Table II shows the effect of adding a silicone resin to an alkyd-melamine baking enamel. As the silicone content increased, so did color and gloss retention, flexibility and resistance to impact.

High temperature aluminum paint was the first large market for silicone resins[1] in the protective coatings industry. But in many applications the high cost of a 100% silicone resin based coating prohibited general usage on smoke stacks, boilers and other equipment operating at moderate temperatures. Continued laboratory work to find lower cost formula-

Table I. Compatibility of Dow Corning 840 resin with various organic resins.

Percent Silicone	10	25	50	75
Short oil, nonoxidizing alkyd	C	C	C	C
Short oil, oxidizing alkyd	C	C	C	C
Medium oil, oxidizing alkyd	C	C	C	C
Long oil, oxidizing alkyd*	C	SI	I	C
Phenolic, reactive	C	C	C	C
Phenolic, non-reactive	C	C	C	C
Urea formaldehyde	C	C	C	C
Melamine formaldehyde	C	C	C	C
Triazine formaldehyde	C	C	I	I
Coumarone	C	C	C	C
Nitrocellulose, ½ sec, RS type	I	I	I	I
Ethyl cellosolve, std ethoxy, 20 cps	C	C	C	C
½ sec butyrate	C	C	C	C
Chlorinated diphenyl	C	C	C	C
Epoxy**	I	I	I	I
Chlorinated rubber	I	I	I	I
Acrylics	C	C	C	C
Tung oil	C	C	C	VSI
Linseed oil	C	VSI	SI	SI
Polystyrene	I	I	I	I
Styrene butadiene	SI	I	I	I
Vinyl chloride-acetate	C	SI	I	I
Vinyl acetate	C	C	C	C
Vinyl butyrate	SI	I	I	I

*Compatible in all proportions with a few resins of this type.
**Compatible at low concentrations of silicone (i.e. 1%).

Table II. Effect of Dow Corning 840 resin in alkyd-melamine baking enamel.

Resin	% Dow Corning 840 Resin	Color	Heat Aged 100 Hours at 400°F: 60° Gloss	½" Flex	Adhesion	Impact*
Nondrying	0	Brown	3	Fail	100%	1
alkyd + 10%	25	Tan	13	Pass	100	2
melamine	50	Lt. tan	43	Pass	100	3
resin	75	Off white	69	Pass	100	4

*Impact: 5 – No failure
0 – 100% failure

Table III. Low cost aluminum coating, Dow Corning XP-7-1050.

Formulation	lb/100 lb	lb/100 gal.
Aluminum Paste (72% NVM TT-A-468, Type II, Class A)	37.5	354
Dow Corning 840 Resin (60% NVM)	4.5	42
Nondrying alkyd resin Duraplex ND-77, (60% NVM)	40.5	383
Xylene	17.5	166
	100.0	945
Typical Properties		
Total solids, percent	54.0	
Pigment to binder ratio	100/100	
Pounds per gallon	9.45	
Viscosity, No. 4 Ford Cup, sec.	160	
Suggested thinners	Aromatics	
TT-P-0028 Requirements		
Heat resistance at 1200°F	Passes	
Salt spray, 16 hours/500°F	No failure	
8 hours/600°F	No failure	
16 hours/900°F	No failure	

tions indicates that the addition of 10% silicone resin[1] may greatly improve some organic aluminum paints. The formulation given in Table III is designed to meet the requirements of TT-P-0028 (Navy Ships). While it is suitable for stacks, mufflers and other high temperature equipment operating at 500-600°F, this silicone-alkyd aluminum formulation will withstand temperatures to 1200°F. At 1200°F, however, it does not have the durability exhibited by formulations based on a 100% silicone resin vehicle. Other low cost aluminum coatings can be formulated by blending silicone resins with coumarones, chlorinated diphenyls, ethyl cellulose, ester gum and similar thermoplastic resins.

Weather Resistance

The excellent weathering resistance exhibited by silicones make them useful additives for exterior coatings to improve color and gloss retention, limit chalking and increase life. Trim 'n trellis paints, exterior maintenance paints, and automobile enamels are among the various types of coatings that have been upgraded by the addition of silicones. The addition of five percent of a compatible silicone resin[1] to a short, medium or long oil alkyd generally gives a noteworthy increase in chalk resistance, color and gloss retention. As the amount of silicone resin increases to 25%, the degree of gloss and color retention and chalk resistance also increases. Table IV shows the effect of weathering of a white enamel containing this resin. After three years of exposure the enamel containing ten percent silicone still exhibits less tendency to chalk and greater gloss retention. At 25% silicone there is no chalking and excellent gloss retention.

In Table V is a typical formulation for an exterior paint containing 25 percent silicone.

Silicone resins[1] have found application in nitrocellulose, ethylcellulose, ½ sec butyrate, and acrylic lacquers. Formulators have found that the addition of a compatible silicone resin to some ethylcellulose coatings improves chalk resistance and water repellency, increases adhesion to metals and glass, and increases weathering properties of a clear coating. In an

automotive lacquer based on ½ sec butyrate, the addition of 10 percent of a compatible silicone resin exhibited excellent gloss retention after one year of Florida exposure. The addition of silicone modified alkyd resins to nitrocellulose lacquer gives only slight improvement in gloss retention, but a measurable improvement in film retention and corrosion resistance was noted after three years of Michigan exposure. Larger amounts of silicone, up to 50%, further improve weathering.

The addition of small amounts of a silicone resin to epoxyamine systems generally improves film properties. One percent of a compatible silicone resin[1] added to an epoxy-amine system improves flow so that cratering or non-wetting will be reduced. Figure 1 shows how one percent of Dow Corning 840 resin added to epoxies overcomes non-wetting. Silicone-epoxy copolymers also exhibit good flow and wetting properties.

Silicone resins are also used as additives in many special coating applications. Some of the more important uses are:

1. To speed grinding in difficult formulations.
2. To improve scuff resistance of label lacquers.
3. To improve water resistance of electrical dipping varnishes.
4. To improve heat and moisture resistance of abrasive bonding resins.
5. To improve the adhesion of caulking compounds to glass.
6. To improve the heat resistance of lamp basing cements.
7. To improve moisture resistance of resistor coatings.
8. To improve heat resistance of rotogravure inks.
9. As an additive in flame retardant paint TT-P-26a.
10. To retard bubbling in urethane varnishes.

Silicone Fluids in Coatings

Silicone fluids are used extensively as additives in industrial enamels, lacquers and architectural finishes.

Table IV. Effect of Dow Corning 840 resin on weathering of a white enamel.

Organic Resin	% Dow Corning 840 Resin	Initial	3 years Exposure	Chalking
Short oil soya alkyd	0	84	4	Heavy
	2½	84	5	Heavy
	5	84	5	Medium
	10	87	16	None
	25	84	57	None

Table V. Exterior trim and trellis paint using Dow Corning XP-1-1059.

	lbs/100 lbs	lbs/100 gal
Toluidene red	10.4	87.4
Dow Corning 840 Resin (60%)	21.7	182.3
Long oil alkyd – Aroplaz 1241 (70%)	55.9	469.6
Bentone 34	.31	2.6
Cobalt octoate (6%)	.23	1.92
Manganese naphthenate (6%)	.11	.91
Calcium naphthenate (5%)	.23	1.92
Anti-skinning agent	.02	.15
SC #150 solvent	11.1	93.2
	100.00	840.00
Total solids	62.9%	
Pigment to binder ratio	20/100	
Pounds per gallon	8.4	
Viscosity, No. 4 Ford Cup	135 seconds	
Suggested thinner	High flash mineral spirits	
Cure	Air dry	
Gloss 60°	98	

Table VI. Effect of silicone fluids on pigment floating.*

Silicone Fluid	ppm** 0	5	25	50	100	500
Dow Corning 200 Fluid, 100 cs.	100***	40	10	0	0	0
Dow Corning 510 Fluid, 100 cs.	100	50	10	0	0	0

*Light Grey Alkyd Enamel, TiO_2 and carbon black.
**ppm – parts per million of paint
***percent floating

Table VII. Effect of silicone fluids on mar resistance.

Resin	Silicone Fluid	ppm*	Coefficient of Friction
Nitrocellulose Lacquer		0	.6009
	Dow Corning 510 Fluid, 100 cs.	100	.2493
	Dow Corning 510 Fluid, 100 cs.	1000	.1944
	Dow Corning 200 Fluid, 100 cs.	100	.2035
	Dow Corning 200 Fluid, 100 cs.	1000	.1763

*Parts per million of Lacquer

Table VIII. Painting over silicone-contaminated surface.

Dow Corning 200 Fluid, 350 cs.	Red Alkyd Base Enamel	White Cellulose Lacquer
ppm*	% Wetting	
0	10	10
50	80	80
100	90	90
300	100	100
500	100	100
1000	10**	100

*Parts per million
**Too much fluid added for this system

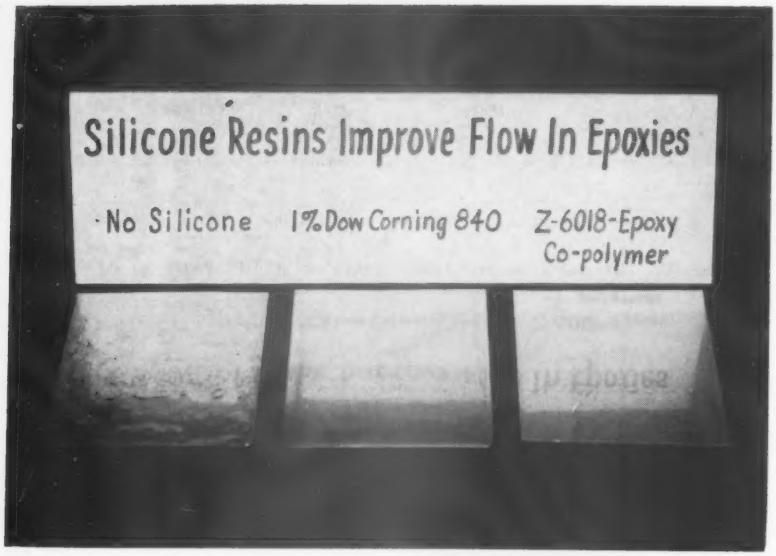

Figure 1. One percent of Dow Corning 840 resin added to epoxies overcomes non-wetting and improves flow properties.

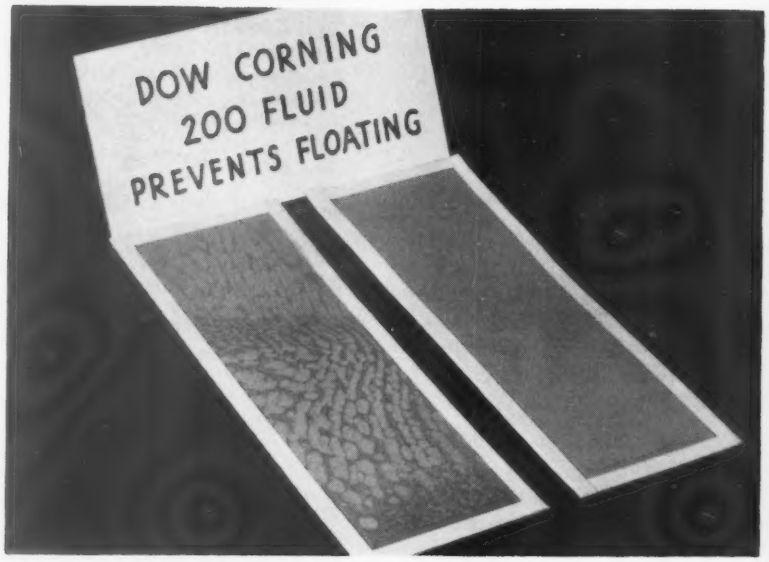

Figure 2. The effect of 100 ppm of silicone fluid in a light blue enamel prevents floating.

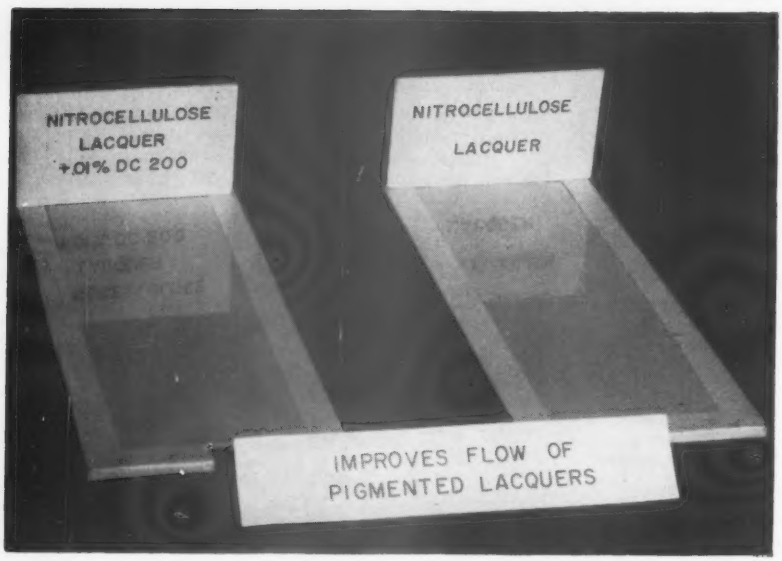

Figure 3. The addition of 0.01 percent of a silicone fluid improves flow properties of a pigmented lacquer.

These fluids are effective at very low concentrations. In most applications less than one percent in required.

Probably the most important current additive application for silicone fluids is as an antifloating and antisilking additive[4] to reduce objectionable color separation. Silicone fluid additives are used in white coatings tinted with such pigments as carbon black, phthalocyanine blue, Prussian blue and toluidene red. Silicone fluids are especially useful where a certain color must be matched and specific pigments are required. Figure 2 shows the effect of 100 ppm of a silicone fluid additive in a light blue enamel. The addition of the silicone fluid completely eliminated the floating of the phthalocyanine blue pigment. Table VI shows the effect of silicones in overcoming floating in a light gray—TiO_2, carbon black- paint. As indicated in the table, the addition of 50 parts per million of a silicone fluid eliminates pigment floating.

In many applications, more mar resistance is required than the vehicle alone provides. Improvement in mar resistance may be obtained by adding a silicone fluid[5]. Table VII shows the reduction in coefficient of friction which can be obtained by the addition of a small percentage of silicone fluid. Here, the dimethyl siloxane fluids are more effective than phenyl methyl siloxane copolymers.

The flow of many lacquers and enamels can be greatly improved by the addition of small percentages of a silicone fluid.[4] In lacquer type finishes, striations often mar the appearance. This is very noticeable in furniture and metallic pigmented lacquers. Figure 3 shows how the addition of 0.01 percent of a silicone fluid improves flow properties of a pigmented lacquer.

Surfaces which have been protected with a silicone polish are sometimes difficult to refinish with certain coatings. The wetting properties of the refinishing paint can often be improved by the addition of a silicone fluid[4] to the paint. When the proper balance is reached, the surface is easily refinished. Table VIII shows the effect of adding a silicone fluid to a refinishing enamel and to a refinishing lacquer. At a concentration of 300 ppm, the refinishing enamel gave a uniform coating.

Decorative varnishes tend to bubble when brushed, making them extremely difficult, if not impossible, to apply. By the addition of 100 to 1000 ppm of a silicone fluid[6], most varnishes can be made to flow smoothly with the desired application properties. In some varnishes, however, the addition of the silicone fluid will increase the tendency for early skinning and thus may be objectionable.

A special silicone fluid[7] is available to produce hammer finishes with many types of protective coating resins. It can be used with baking and air drying enamels such as alkyds, alkyd-amines, epoxies, silicones and modified silicones. This fluid is also effective with several lacquers including nitrocellulose, ethylcellulose, butyrates, acrylics and vinyls. It will produce hammer finishes at concentrations of 0.3 to 1.0 percent. Low concentrations produce coarse appearing hammer finishes, while high concentrations produce a very fine hammer finish effect. With proper control of the fluid concentrations, viscosity, spraying pressure and solvents, a formulator can prepare any hammer finish desired. Figure 4 shows the hammer effect achieved by the addition of this special fluid to a blue metallic nitrocellulose lacquer.

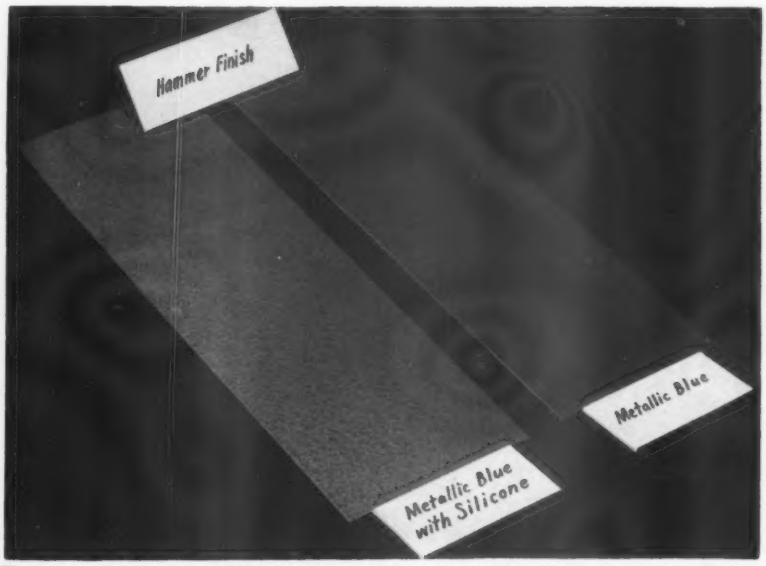

Figure 4. A hammer effect is obtained by the addition of a special silicone fluid to a blue lacquer.

Since silicone fluid additives are effective at unusually low concentrations most formulators add them to the finished coating after or during the final blending. That's because silicones, particularly dimethyl silicone fluids, have exceptionally strong surface active properties. Residual quantities of this silicone fluid may contaminate subsequent production. Formulators should be alert to the importance of thoroughly cleaning all equipment after contact with a dimethyl silicone fluid.

Silicone resins are much more compatible with organic coatings, and generally do not cause any adverse effect if residual quantities remain in processing equipment.

Silicones are widely used, practical paint additives that enable paint formulators to achieve various desirable properties, characteristics and effects. Silicones offer such an unusual combination of properties that their potential uses for a variety of purposes is virtually unlimited. They warrant further consideration and evaluation by paint formulators who have the know-how and experience necessary to use these unusual semi-inorganic materials in creating better and more useful coatings.

Silicone Additive Footnotes

(1) Dow Corning 840 Resin
(2) Dow Corning 840 or Dow Corning 808 Resin
(3) Dow Corning 805 Resin
(4) Dow Corning 200 Fluid, 100 cst
(5) Dow Corning 200 Fluid, 100 cst or Dow Corning 510 Fluid, 100 cst
(6) Dow Corning 510 Fluid, 100 cst
(7) Dow Corning F-4290

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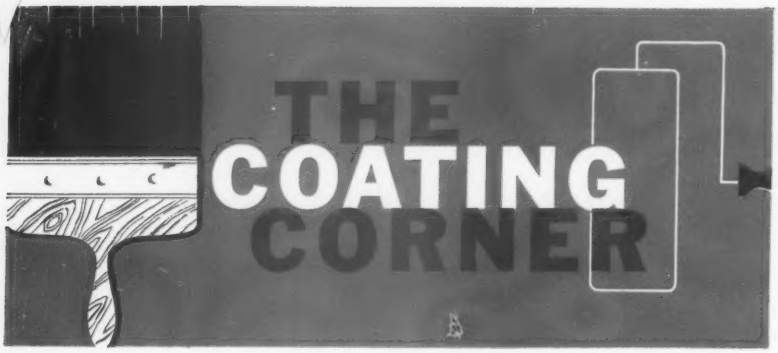

By
Phil Heiberger

The author continues his random reflections on various aspects of the paint industry. The opinions expressed in this column are his alone and do not necessarily reflect those of this publication.

Tower of Babel

The editors of *Behavioral Science* saw fit to include the following four paragraphs in the April 1959 issue:


P. Heiberger

"*European Scientific Notes*, Office of Naval Research, London, reports that Mr. L. J. F. Brimble, editor of *Nature*, delivered some brutally frank injuctions to scientists at the 120th Annual Meeting of the British Association for the Advancement of Science held in Glasgow last summer. Speaking under the title of *The Presentation of Science by Scientists to Scientists in Different Subjects*, he declared that scientists are erecting a Tower of Babel which is preventing communication not only between them and the public but between themselves and 'It's time you stopped!'

"Brimble declared that *Nature* is the most unreadable journal in the world today. When it was started in 1869, *Nature* was a popular journal supported by literary writers. It was a medium of exchange of scientific information which all readers could understand. By contrast today, 'scientists are making their Tower of Babel worse and worse.' First they made their jargon worse. Then they put new meanings to common abbreviations so that none but those in their own field would understand; these technical abbreviations now number thousands. Next the use of esoteric phrases became deliberate, sometimes with the intention of concealing meaning from others in the same field.

"This landslide into total confusion must be stopped. There are people who want to understand science but 'how can they when you scientists don't understand each other?' Scientific results can not reach the public unless writers express themselves clearly and simply. All principal newspapers now have special technical staffs, but even scientifically trained reporters can not report a BAAS meeting today. It is up to the scientist to speak English that can be interpreted to the public.

"*Nature* in 1869 tried to do two things: to act as a forum and to interpret science. In succeeding decades it has attempted to become the scientists' medium of communication. A glance through a current issue of *Nature* will show to what extent it has become the international forum of scientists, and yet no one can read and understand all the columns in even one issue."

Experts Can't Write

From our own side of the Atlantic comes a similar complaint, but this critic does not confine his criticism to scientists; he indicts all experts, in fact, almost all educated people. The March 30, 1959 issue of *Chemical and Engineering News* contains reference to provocative statements of J. Harold Janis of New York University.

Educated people, Janis declares, lack the ability to pass on the information they have gathered because of either under or overdeveloped vocabularies. Instead of writing for their readers' edification, they write for their own. Janis, whose own specialty is business writing, blames the difficulty on telephones, intercoms, dictating machines, precomposed report outlines, form letters, reply cards, and coupons in the field of business writing, and greeting cards in social communication areas. These devices, he feels, deprive people of writing practice, with inevitable results.

Janis also levels his attack at college teaching that fails to impart knowledge in modern writing techniques. Readability, simple words, short sentences with active verbs, and interpretation of data are imperative, and unless young scholars and specialists learn these techniques, Janis foresees the day when

every expert will need a ghost writer.

Study Semantics

Things are not quite that black yet, and let's hope we can stave off the time when they will be. Merrit Williamson, writing in the April 1959 *Industrial Laboratories*, suggests that scientists and engineers study language in all its various aspects. Intrigued himself with the problems of conveying ideas from one person to another, Williamson recommends Charlton Laird's *The Miracle of Language* (published by Fawcett Publications, Inc., Greenwich, Conn.) to all those interested in linguistics and allied subjects. He also recommends *Some Key Terms and What They Mean in the Engineering Function*, a little pamphlet that was originally prepared by the General Electric Company just for the use of its own personnel, but will soon be published and available to the public at large.

"When one wishes to communicate," Williamson asserts, "One must first think of how to express the idea. The matter to be communicated must be expressed through the medium of fixed blocks of language called words."

The rapid progress made in science and engineering in the past 100 years is largely due, in Williamson's opinion, to the fact that there are so many technological terms precisely definable by mathematical expressions. This has obviated time wasting haggling over concepts.

Functional English

Another helpful little book was published by the MacMillan Co. in New York in 1958. *The Presentation of Technical Information* by Reginald O. Kapp emphasizes the need for functional English. The writer must say what he really means in such a way that his audience knows what is said and understands it. The reader is a collaborator with the writer who must attract his reader's attention and keep it. Otherwise the work may be "lost," i.e., bypassed, forgotten, or improperly summarized.

Perhaps we all can't become good writers, but rather than gamble on the possibility of a good summary being written by someone else for abstract use, the least an author can do is to be his own abstractor and provide his own summary.

Newtonian Fluids

Just on the chance you may not be a steady reader of *Tappi*, the article by R. C. Chase should be noted. (*Tappi 42*, 97 (1959)). The title is self-explanatory. It is *A Correlation for the Hercules, Hagan, and Brookfield Viscometers for Newtonian Fluids.*

In this paper an attempt has been made to correlate the instruments using a Newtonian fluid of known viscosity. The author ends by saying "A sequel to this work should be a continuation with standard non-Newtonian and thixotropic materials. "And to this we add a fervent "Amen."

Surface Treatment

Crystal ball gazing is a popular and harmless pastime for many. Occasionally, a prediction may materialize. In the January 1959 issue of *Industrial and Engineering Chemistry*, Anton de S. Brasunes prepared A Corrosion Review for 1958. In so doing he made several projections into the future.

On the subject of surface treatments, he stated, "Surface impregnation treatments wherein several elements are diffused inward simultaneously and have a very complex structure, are coming to the fore. Such metal surfaces may have unusually attractive characteristics, such as excellent wear resistance, unbelievably high hardness, and good corrosion resistance. Unverified reports are so optimistic that they seem unbelievable."

Oleochemistry in Action

One is kept dizzy enough trying to keep up with the deluge of synthetic resins, latices, emulsions, and modifications of everything vying to replace drying oils, but agricultural scientists are not content to be outmaneuvered either. They have a veritable arsenal of weapons too—new oils from new sources and old, better yields, higher unsaturations, new analytical techniques and a more sophisticated technology.

Chemists at the Northern Utilization Research and Development Division of the U. S. Department of Agriculture find that the cape marigold contains a unique fatty acid, dimorphecolic acid. This fatty acid was discussed at the recent American Chemical Society convention in Boston, when C. R. Smith, Jr., T. L. Wilson, F. H. Melvin, and I. A. Wolff gave a paper called "Dimorphecolic Acid—A Unique Hydroxydieneoid Fatty Acid."

Dimorphecolic acid appears to be the first naturally occurring long chain fatty acid that is a conjugated diene, and in accordance with the need for describing fatty derivatives by group and spatial structures, the new acid is suspected to be 9-hydroxy-*trans,trans*-10, 12-octadecadienoic acid. This product is still a long way from commercialization but it is pleasant to know that oleochemical research is still vigorous and lively.

Foaming and Defoaming

Although much has been written on foaming and defoaming, the theories underlying the phenomena are conflicting and a common understanding is lacking. Unfortunately, most of the work pertinent to the paint field is simply empirical, and past experience counts for little when one is confronted with new problems.

In *Kolloid Zeitschrift 159*, 11 (1958), Tsumetaka Sasaki and Satiko Okazaki (Tokyo Metropolitan University) wrote a paper entitled "Some Remarks on Foaming and Defoaming."

Of particular interest to paint people is a series of comments on the defoaming action of antifoamers with 0.5% aqueous saponin solution. "Here again we cannot express with a single factor which is the better antifoamer. However, we can properly express the difference in the antifoaming action of the two additives (butyl alcohol and silicone oil) using two factors. Thus, in our present case, foam breaking power is strong but foam preventing power is weak for butyl alcohol, while the reverse is true for silicone oil antifoamer. The terms antifoaming, defoaming, foam extinguishing and foam killing are often used carelessly, in a rough sense, they imply both of the above two factors."

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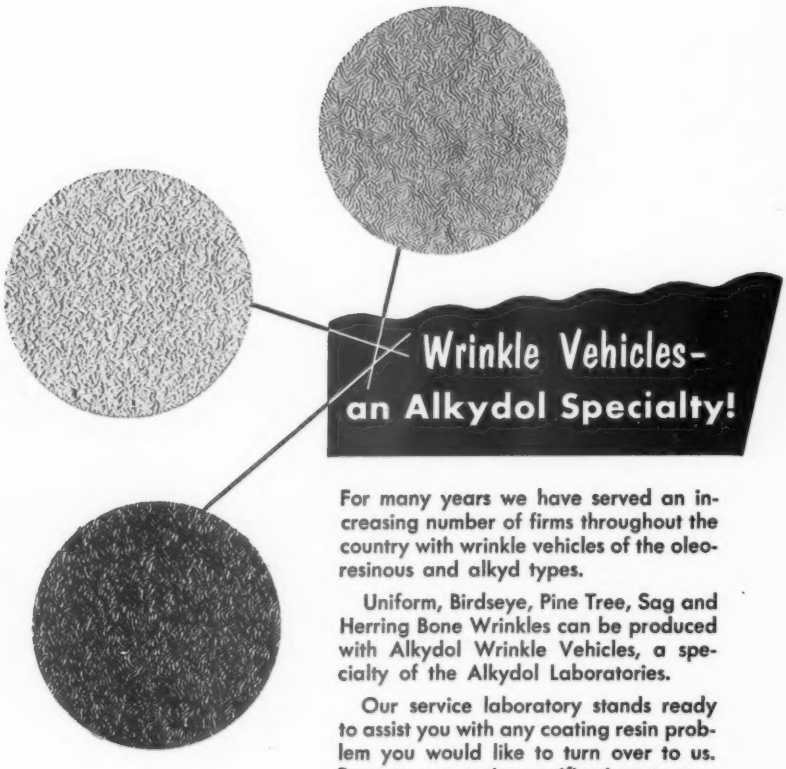

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XX-505	Medium	Nodular	15
XX-601	Medium	Acicular	14
XX-602	Fine	Acicular	20

LEADED

Brand	Relative Particle Size	Particle Shape	Oil Demands
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LEHIGH-61 (35% Leaded)	Medium	Nodular	14
LEHIGH-112 (12% Leaded)	Medium	Nodular	10
LEHIGH-118 (18% Leaded)	Medium	Nodular	9
LEHIGH-250 (50% Leaded)	Medium	Nodular	12
LEHIGH-635 (35% Leaded)	Medium	Acicular	13

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Quality-controlled at every step of production, *Pittsburgh* Phthalic Anhydride maintains good molten color stability over long periods, and requires no special alloy steels for handling. It is essentially free of maleic anhydride and benzoic acid, thus assuring uniform reaction rates and reducing product variations.

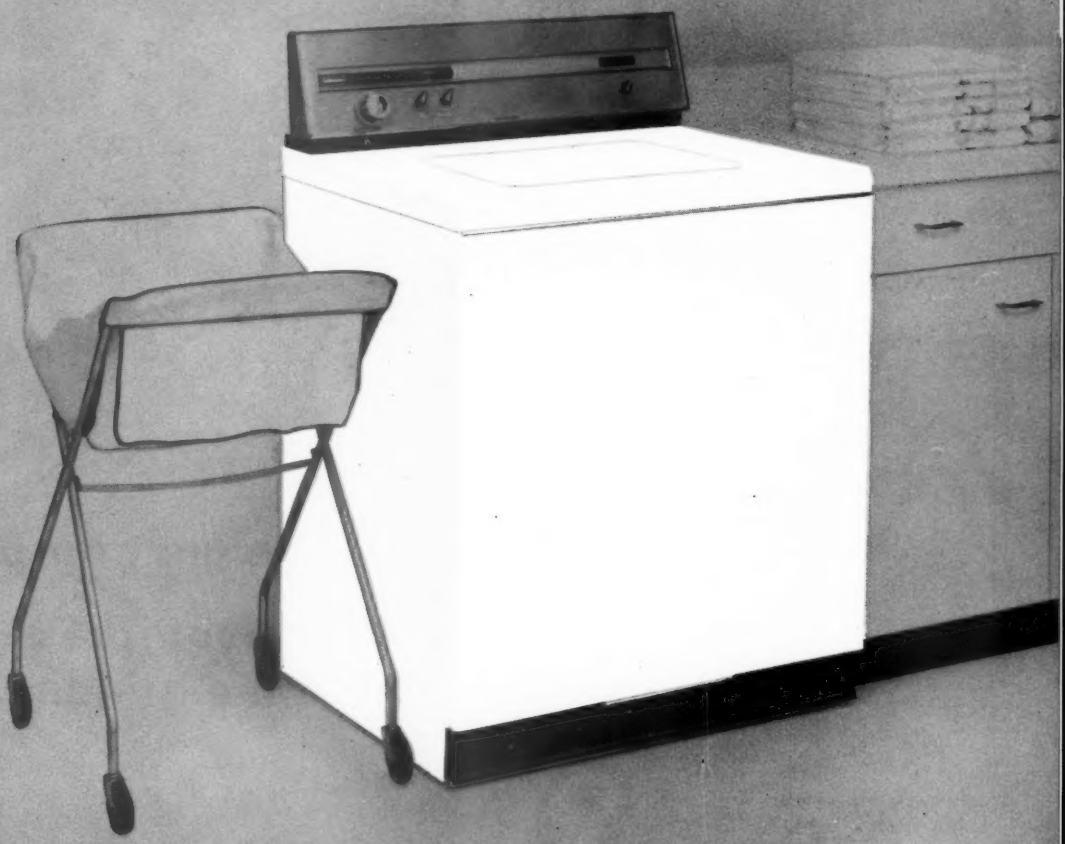
Let us know about *your* P.A. problems today. *A call or wire will place an experienced Pittsburgh Industrial Chemicals man at your service!*

WSW 7046

COAL CHEMICALS • PLASTICIZERS • PROTECTIVE COATINGS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

FINEST APPLIANCE FINISHES...

begin with Glidden R-11 Zopaque® Titanium Dioxide



Appliance finishes that really sparkle need the excellent gloss and color performance provided by Glidden R-11 Zopaque Titanium Dioxide. R-11 Zopaque is the finest low oil absorption grade of titanium dioxide obtainable. What's more, R-11 possesses greatly improved dispersion characteristics, and provides high hiding power, greater whiteness and cleaner tints.

Write now for complete details about how R-11 Zopaque can help improve the product finishes you manufacture. Additional special grades of Zopaque are also available for the formulation of product finishes.

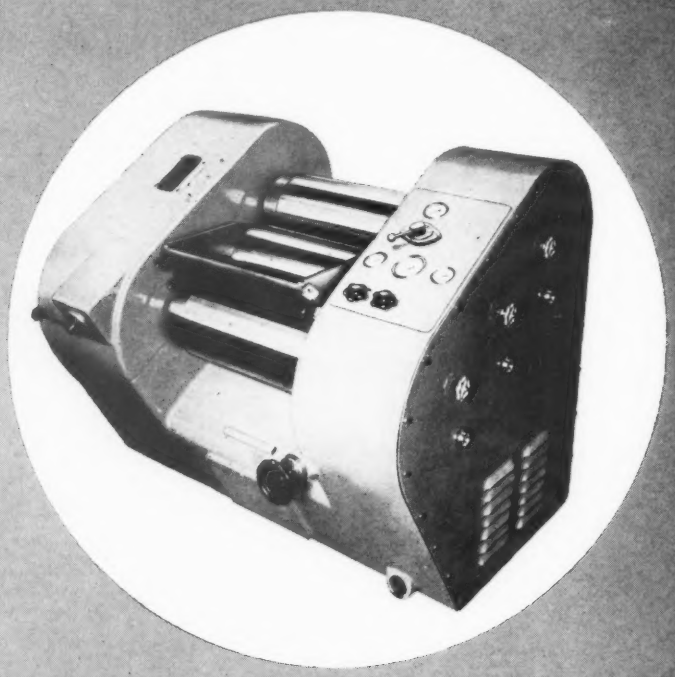
QUALITY Glidden PRODUCTS

FINEST PIGMENTS FOR INDUSTRY

The Glidden Company
Chemicals—Pigments—Metals Division
Baltimore 26, Maryland

New *fully hydraulic*

BUHLER
3-Roll Mill



SDA
Roll Dimensions: 10" x 20"

SDT
Roll Dimensions: 16" x 32"
16" x 40"

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• Absolutely even pressures for uniformly fine grinding

1. New hydraulic regulating system provides absolute pressure stability and easiest (1 second) setting of rolls.

2. Determines exact pressure for any formula and duplicates it for that formula at any time.

3. Rolls disengage for cleaning in *1 second.* A simple hand-lever shift disengages rolls and scraper blade instantly. By shifting hand-lever back to operating position, rolls and scraper blade are restored to the exact pressure they were set at before disengaging.

4. New feed hopper arrangement increases working surface. Hopper cheeks do not rest on the roll, but are hydraulically pressed to the shoulder of the roll; permit grinding across the whole length of the roll, with even wear.

5. Hydraulically operated scraper blade maintains selected pressure irrespective of wear. Never loses pressure — hydraulic control takes up automatically to maintain exact selected pressure with wear.

6. Can be furnished with variable speed drive for the first roll, or driven by a 2- or 3-speed motor. Regulating the speed of the first roll for paints and inks of different consistencies increases the capacity 60% and more.

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PRODUCTION

PACKAGING

MATERIAL HANDLING

NEW EQUIPMENT and MATERIALS

A good safety program is an important factor in maintaining a high level of production. In his column (page 61) L. Shatkin, our production editor, outlines ways and means to obtain an effective safety program in your plant.

now! the most important new can development of the century!

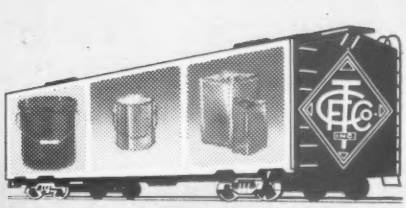
FEIN'S NEW "SHELF-LIFE"

2 GALLON LUG COVER STEEL PAILS

INCREASE SHELF-LIFE BY 300%

New filling line cuts down air space!

Now... a great new triumph in pail development! The new "SHELF-LIFE" pail designed by Fein's engineering and research departments with the close cooperation of over thirty of the paint chemists associated with leading manufacturers. Tests run by your chemists have proven that the use of this new pail will increase the resistance to skinning of alkyd, odorless, and other paints prone to skinning at least 300% as compared to previously manufactured 2 Gallon pails. Fein's new "SHELF-LIFE" pails raise the filling line to reduce air space... and keep your profits from "skinning" away!



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AN EFFECTIVE SAFETY PROGRAM

By
Lawrence Shatkin

H. W. HEINRICH, a pioneer and leader in the safety movement stated, "Accident prevention is both a science and art. It represents, above all other things, control—control of man performance, machine performance, and physical enviroment. The word "Control" is used advisedly because it connotes prevention as well as correction of unsafe conditions and circumstances."

The job of the production manager is to increase production and lower unit costs. Encompassed within this program are management practices that help to attain this goal. A good safety record will help achieve this objective. A preventive safety plan will give impetus to its advancement.

Basic Philosophy for Safety

In order to develop an accident prevention program certain safety concepts must be evolved. In the first place, accidents do not happen by chance, but by causes. Secondly, certain steps or procedures must be introduced to control accidents, and corrective measurements must be taken to ensure that the same type of accident will not repeat itself. A better understanding of why accidents happen is needed in order to enhance the preventive safety program.

Accidents Cut Productivity

Productivity is related to accidents, and we must determine what that relationship is. When an accident occurs we lose more than the production effort of the injured person. How much we lose depends upon the situation. It can run several times the productivity of the injured person. It is contingent on how the rest of the group reacts to the accident, and on how well the foreman handles the circumstances.

The decrease in production in terms of units produced is further aggravated by a tendency, at this time, to have an increase in the number of defective units produced. An accident reaction curve depicted in figure 1 indicates an almost instantaneous production drop, a minimum level, and a gradual recovery to the production level that existed before the accident occurred.

Role of the Supervisor

Reports indicate that outstanding safety records are being posed by large plants in both light and heavy industries. This is not taking place by chance. Invariably, it is happening where line supervisors and foremen are taking an active part in the safety program. Safety has been put on a personalized basis, because the line foreman is in a position to know his men, their working area, the materials at their disposal, better than anyone else on the management team. The effort put forth in this manner will bring rewards in the form of better employee relations, the acceptance of supervisory leadership, increased production, better quality, and lower costs. Management must recognize the importance of obtaining the participation of the worker in any safety program. The first line supervisor is the limiting factor to the success of such a plan.

The fact that the average worker is interested in his job, wants to discuss it, has suggestions to offer, is eager to be recognized, denotes that within the work area certain fundamentals can be established in regard to safety. These concern

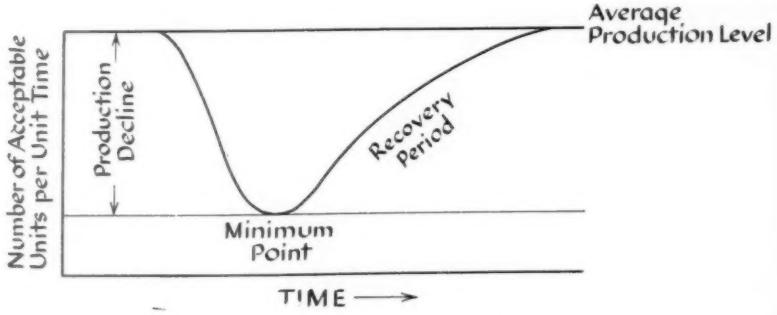

Figure 1. An accident reaction curve.

The opinions expressed in this feature are not necessarily those of any particular firm or organization.

Flash arresters and vent valves on solvent storage tanks help minimize the possibility of a disastrous fire.

the job, the worker and his workplace.

Job Analysis

Job analysis is a method of investigating the essentials of definite work assignments. It involves a systematic series of steps, careful observation and study of the job, and reporting pertinent information relative to the nature of a specific job. The objective is to provide job facts for a specific purpose. Within this area, a job hazard analysis can take place describing among other things the job description, location, tools used, potential health and injury hazards, equipment needed, and recommended safe practices.

Job analysis can be used to orient and train new men on their jobs. However, its main use should be for the constant retraining and reminding which the workers require. Past records will disclose where difficulties have occurred in regard to safety, and this should serve as a starting point for job-hazard analysis.

Safety mindedness must be frequently discussed. This can be supplemented by publicity media but must not be used as a substitute. The foreman will be afforded a wealth of information from these job analysis reports. Since safety is concerned largely with specifics and not generalities, such information is conducive to good safety training.

A job analysis program tends to promote worker participation in safety. It is a means for developing job and leadership skills in the foreman, while allowing for contributions by higher management levels and the safety department.

Role of Maintenance

Many safety personnel agree that two very important factors in building up a safety program are preventive maintenance and a follow-up of the preventive maintenance report. Preventive maintenance as it applies to housekeeping, is a systematic program of inspection of buildings and floors, and of the work performance by every worker. Safety is born of preventive maintenance, supervised from a top executive level.

Fire Prevention

On August 12, 1953, fire leveled the Hydra-Matic transmission plant of General Motors at Livonia, Michigan—a plant that was rated a model of fire prevention. Since that occurrence, General Motors has operated on the theory that 100 per cent safety is not enough.

Many of GM's operations have built-in fire hazards. Most of its plants use combustible materials to some degree. With these factors in mind, sections of their one-story plants have been subdivided by fire wall barriers. Much consideration has been given to the relocation of hazardous operations. Such jobs as paint mixing, storage of flammable liquids, and acetylene generation have been moved to separate buildings. Many areas are being 100 percent sprinkler covered, and much emphasis has been placed on mobile fire-fighting carts that can bring an array of equipment to play on any place.

Fire Brigade

It is strongly urged that every paint plant have a fire brigade, not only on paper, but in practice. The following questions will serve as a checklist. Are fire extinguishers in best locations? Is number of and location of extinguishers adequate for the activity? Are procedures in case of fire understood by personnel? Have personnel had any instruction in the use of fire apparatus? Are any materials unnecessarily stored which would aggravate the spread of fire? Are volatile combustibles or explosives stored in area? Are required combustibles or explosives kept in approved labeled containers?

Classification of Fires

The National Fire Protection Association classifies types of fires as follows:

Class A—Fires in ordinary combustible materials such as wood, paper, textiles and rubbish. To extinguish such fires, the quenching or cooling effects of water or solutions containing large proportions of water are required.

Class B—Fires in flammable liquids such as gasoline, solvents, oil, grease, paint, varnish, and lacquers, where a blanketing or smothering effect is essential to put out the fire.

Worker unconsciously tosses a match into a refuse barrel containing oily rags. This could result in a major fire unless quick action is taken.

Nonsparking conductive floor covering prevents fires caused by static electricity.

Class C—Fires in electrical equipment such as motors, generators, and switch-panels. Because of an electrical hazard, a non-conductive extinguishing agent is required.

Study and Analysis of Accidents

The purpose should be to develop better means for carrying on an accident prevention program. Both the contributing causes and immediate causes must be determined in order to achieve good results in accident prevention, so that measures may be taken to prevent similar accidents.

Each investigation should be made by the first line supervisor as soon after the accident as possible. Fairness is absolutely essential. The value of the investigation is largely destroyed if there is any suspicion that its purpose or result is to "whitewash" anyone or to "pass the buck."

No accident should be described as caused by "carelessness." It connotes nothing. It doesn't lead to corrective measures. It will not lead to the cause of the accident.

Safety must be designed, written, rehearsed, practiced, and reviewed. It must be kept running by publicity, favorable criticism, frequent revision, and constant performance. A dollar of prevention is worth ten dollars of compensation. What is of greater importance, is that the department or company with the high accident rate loses very rapidly its esprit de corps.

New Developments

Radiant Color Company New Fluorescent Pigments

New fluorescent pigments, under the trademark name Velva-Glo, have been developed by the Radiant Color Co., Dept. PVP, 830 Isabella St., Oakland 7, Calif.

Velva-Glo pigments are produced in finely ground size from a synthesized fluorescent compound. The powder is free flowing and does not agglomerate. If required, further reduction in particle size can be achieved by conventional milling operations. Dispersions of Velva-Glo pigment as furnished will result in a Hegman reading of 5.8.

All Velva-Glo pigments are translucent in nature and require a white background for maximum brilliance. A dry film thickness of 2½ to 3 mils is required for maximum outdoor effectiveness. Outdoor silk screen applications will be effective up to four months,

Bulletin applications of two medium coats up to six months and special fortified formulations up to one year. For instance, silk screen applies approximately 8/10 mil dry film thickness.

The amazing brilliance of Velva-Glo pigments is claimed to represent a phenomenon hither to unknown in conventional colors. Conventional colors are effective only to the extent that they are efficient as reflectors of visible light because the portion of the spectrum they absorb furnishes no functional purpose. In the case of Velva-Glo pigments, visible color is reflected as in the case of conventional colors and, in addition, most of the absorbed light activates the molecule of the pigments so as to be reemitted as a color of a longer wave length than the absorbed light. These pigments are a source of light as well as a reflector of light. They are truly "super-charged" color very similar to a colored electric light bulb.

The effect of heat on the film should be considered inasmuch as these pigments are thermoplastic. When heat, approximately 240° F and above, is applied to the film, the heat can cause the pigment to soften and flow so as to remove the "flat" characteristic of the film—thus a gloss or semi-gloss results. Thermoplastic binders will increase this result as also will higher K.B. solvent systems. The Velva-Glo pigments are made in eight shades: Chartreuse, Orange-Yellow, Orange, Orange-Red, Red, Cerise, Pink, and Blue. Fluorescent Green is achieved by using approximately .3% to 1% of phthalo-cyanine green toner by total weight of paint of a chartreuse formulation. A 10% use of Blue in Pink produces a striking fluorescent Purple. All of the pigments (except blue) can be intermixed for intermediate shades.

Because of the extreme brilliance and clarity of Velva-Glo pigments, they can be used as toners for conventional pigments, achieving results heretofore unknown. Conversely, standard pigments can be used as toners with Velva-Glo formulations wherein maximum brilliance is not required. The more transparent the standard pigment, the more effective the results. Inerts may be used if they are transparent.

Because of the high pigmentation load required, binders which have good durability and wetting characteristics are recommended. Thus acrylics and alkyds are superior to cellulose resins. The above-mentioned characteristic can be used depending upon the results desired. It should be mentioned that the pigments will stand much higher heat and some formulations utilizing same have been successful. The ability to continue to wet and bind for long periods of time lends greatly to lightfastness.

The effectiveness of ultraviolet absorbers found in non-fluorescent films also applies here. The use of one to seven percent, based on solids, greatly extends life of fluorescent color. Usually the solvent system will have to be altered so as to have a minimum K.B. value of 65.

Velva-Glo pigments have good resistance to aromatic and aliphatic hydrocarbons. Use of esters, ketones, and alcohols are not recommended. Strong amines, acids and alkalies tend to darken or damage the pigments.

Disperse	
*P-470 – 70%	34.2%
V. G. Pigment R-103	44.2%
Mix with	
Mineral Spirit – Low boiling	21.0%
Lead Naphthenate 24%	0.3%
Cobalt " 6%	0.15%
Manganese " 6%	0.05%
Antiskinning Agent	0.1%
	100.0%

Thin to desired viscosity with xylol
*Reichhold Chemical, Inc.

Spray brush and dipping formulation.

New Epoxy Varnishes Developed by Carbide

A new coating, recently developed by Union Carbide Chemicals Co., division of Union Carbide Corp., is reported to combine the best features of epoxy and alkyd varnishes.

Epoxy ester varnishes are well-known for their excellent adhesion and alkali resistance. These properties are responsible for the growth of epoxies as appliance, automotive, and can coating primers. However, they have shortcomings as top coat applications, particularly for outdoor use, because of their poor color stability and chalking when exposed to sunlight. Alkyds, on the other hand, hold up comparatively well on outdoor exposure but do not have the adhesion, alkali resistance, and hardness of epoxy coatings.

Epoxide 201 is the starting material for the new type of epoxy varnish. It is free from the light-sensitive phenolic ring structures of conventional epoxy resins, but contains the epoxide groups that allow it to form chemically resistant polyether polymers. It can be modified with a variety of drying oils to provide either room-temperature or bake-drying systems.

In the laboratory, Carbide's new coating, on a metal test panel, withstood the same impact (108 psi ball impact) and alkali (20 per cent caustic) test as a conventional epoxy oil-modified coating. In addition, the coating was harder (86 Sward on glass) and withstood more than a month in an accelerated ultra-violet light test box without apparent change in color, gloss, or hardness. By this same test, a conventional epoxy ester coating was severely discolored, and dulled in just three days.

A novel procedure has been developed to take advantage of Epoxide 201's low viscosity and fast reactivity with fatty acids. Epoxide 201 is first reacted with a drying oil acid during a two-hour cook at 180 degrees centigrade. Final polymerization is effected at room temperature by the addition of a catalyst in enough xylene to give the desired solids content.

Various coating formulations using Epoxide 201 are the subject of pending patent applications.

Take lubricants, for example

There's a USS steel container to meet almost every shipping need

Petroleum is like many other products, spending some part of its life in a steel shipping container. A wide variety of products arrive at their destinations stable, safe, sanitary, in carbon or stainless-steel shipping containers that are manufactured by United States Steel.

USS steel drums and pails come in a variety of sizes and closures, offering flexibility in choosing a shipping container, whatever you may manufacture. They represent the largest, most complete line available today, for the shipment of products as varied as paint and petroleum, chemicals and food, additives and essences.

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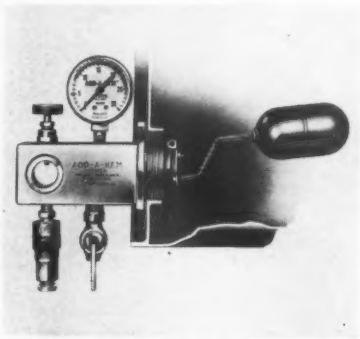
Factories: Los Angeles and Alameda, Calif. • Port Arthur, Texas Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

United States Steel Products
Division of
United States Steel

USS TRADEMARK

NEW EQUIPMENT AND MATERIALS

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



STERLING E. NORCROSS

DRUM PROPORTIONER

Precise Metering Valve

A non-electric, direct-from-drum proportioner named "Pour-Portioner" has been announced.

Fitting into the 2" head bung of all steel shipping drums thru 55 gallons, this compact, pumpless proportioner either separately or simultaneously directly meters light to viscous chemicals at drops per hour thru sight glass, or batch pours thru built-in faucet provision.

Feeder operates by gravity feed with light liquids, or by available vacuum, pump suction or compressed air for very viscous flow. Automatic "empty" indicator gauge and air-tite flow shutoff are provided.

Unit is maintenance free and snap-type coupling makes possible quick drum changing. Accessory fittings said to permit remote drum location for many applications where precise, direct–from–drum metered feeding is required or desirable.

Sterling E. Norcross Companies, Dept. PVP, 19 Osborne St., Bloomfield, N. J.

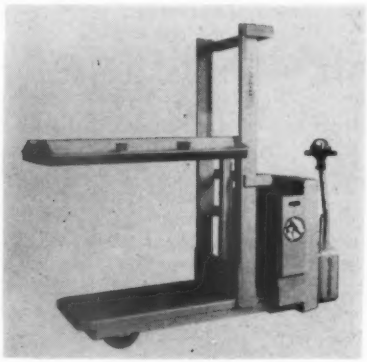
LOAD STABILIZER ATTACHMENT

For Handling Unstable Loads

Load stabilizer attachment adapted for use with its low-lift "walkie" line has been developed.

Designed primarily for handling skid loads of coated flat paper stock, which have a tendency to ride off skids and pallets, the stabilizer is also recommended for all types of loads that are not stable.

The stabilizer is hydraulically operated from the operating handle and clamps down on top of the load. Various clamping heights may be furnished to suit the height of the load by the adjustable top clamp arm.



LEWIS-SHEPARD

Sponged lined pads clamp safely down on any material and hold firmly in place while the load is transported. This feature is extremely practical when travelling over slanted ramps with fragile or slippery loads.

Lewis-Shepard Products, Inc., Dept. R9-4-PVP, 125 Walnut St., Watertown 72, Mass.

DRUM CLEANER

Completely Automatic

Drumatic, a completely automatic drum cleaner, capable of cleaning 1500 55 gal. drums per eight-hr. shift, now available.

The Drumatic consists of a long bath tank containing caustic solution which loosens outside coatings and inside residues. Drums revolve in solution while moving forward to batter of brushes which clean both ends and sides. Built-in lift fork then deposits drums cleaned to bare metal, on rinse rack.

This automatic machine, the makers claim, easily cuts drum cleaning cost in half. With it one attendant cleans as many drums as 12 men with commonly used methods.

Drumatic Corp., Dept. PVP, P.O. Box 3356, Rincon Annex, San Francisco, Calif.

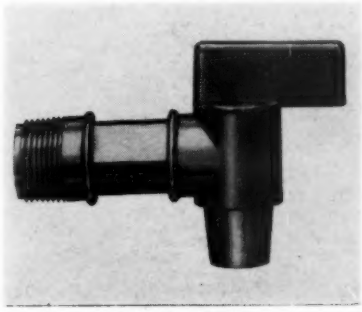
FAUCET

Polyethylene Type

Polyethylene faucet, called "Flo-Rite," has been introduced. The new "Flo-Rite" faucet is molded of a new type polyethylene.

Designed to fit all ¾" standard drum openings, this full-size new faucet is said to give satisfactory service in extreme cold or temperature up to 140° F. without breaking, softening, or bending.

Inside diameter of 5/8" barrel and spout provides largest flow possible from ¾" drum opening.



MULTI-METER

Instant full flow is obtained by a quarter turn of the handle and patented vertical ribs inside spout eliminates dribble or spit.

The elimination of opening and closing threads in the faucet eliminates all possibility of leakage. Faucet will not stress-crack or break and prevents chemical re-

action and contamination of all ordinary products stored in drum containers.

Multi-Meter Corp., Dept. PVP, P. O. Box 6594, 1041 Custer Drive, Toledo 12, Ohio.

AIR CAP
For Spray Painting

A new air cap for automotive spray painting, designed especially for use with the new acrylic and enamel automotive finishes, has been announced.

Designated Model 154, the new spray nozzle is designed to give a "super-soft-spray," which is described as having a wider, wetter pattern.

Design of the nozzle involves the special location of two secondary jets so that they will intercept the side jets to reduce the impact and resultant forward velocity of the spray pattern. Consequently, a broader, softer and wetter spray with more thorough flow-out for a smoother, glossier coat is attained. Better adhesion of the new finishes is also claimed by this improved spray pattern. The distinctive tapered face of the cap has been developed to give smoother air-flow into the spray pattern and reduce the turbulence found over the blunt face of conventional nozzles.

Other features include a sturdier ring to withstand bumps and new resilient O-ring for three-way sealing against air leakage.

The DeVilbiss Co., 300 Phillips Ave., Dept. PVP, Toledo, Ohio.

KINETIC DISPERSION

MIXERS
Variable Speed Drive

The introductoin of the firm's high speed mixing machinery line has been annonnced.

The trademarked "Kadyzolver" line includes the KDZ 100 series with 10, 15 or 20 H. P. motors with variable speed drive, the KDZ 200 with 25 through 75 H. P. drive, and the KDZ 300 series which includes all special designs for top, side, or bottom entry mixing problems. The standard KDZ 100 and 200 sizes have completely self-contained air-oil hydraulic lift units. A feature of the Kadyzolver blade is the non-clogging, turbine bucket design.

Another feature of the KDZ 200 series is an optional water-cooled blade for heat transfer. The KDZ 200 series can also be fitted with variable speed drive to give an overlapping range of rim speeds by the use of interchangeable blades ranging from 12 inch (by 4 inch increments) to 28 inch diameters. Some special blades of 32 inch diameters have been produced. All Kadyzolver blades can be furnished with ceramic tipped buckets.

Shown in illustration is a KDZ 200, 50 H. P., variable speed unit with tachometer and 20 inch non-

"U. S." UNITIZED JAR MILLS

Dependable : Low Cost
Easy to Operate

"SELF-CENTERING"* ROLLS

keep containers centered on mill, reduce friction noise, jar wear and breakage. Jars can't creep and fall off.

EASILY ADJUSTED ROLLS

can be quickly positioned to handle jars from 2½" to 13" in diameter, up to 12" long.

SMOOTH-RUNNING OILITE BEARINGS

assure quiet operation and long, trouble-free performance.

STURDY WELDED STEEL FRAME

built for rigorous continuous service. Fully portable, yet heavy enough to stay put.

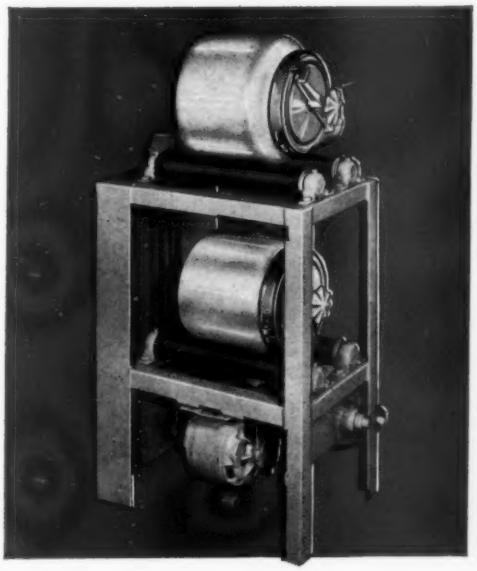
LONG-WEARING ROLLS

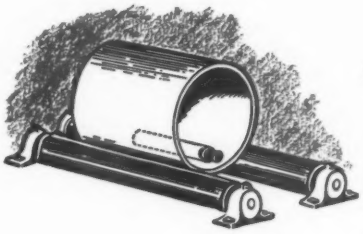
made of special Neoprene rubber permanently molded on solid steel core. Resistant to oils, chemicals and solvents.

WIDE RANGE OF STANDARD SIZES

"U. S." offers a wide choice of capacities to meet every laboratory or specialized production requirement. Either constant or variable speed drives are available, as well as other optional features such as tachometers, automatic timers, etc., for utmost adaptability.

*Patented





HANDY HINTS ON JAR MILLING

Extremely small containers, such as test tubes or small paint cans, can easily be rolled on your jar mills by placing them inside a piece of pipe or larger round container.

For additional helpful grinding and mixing data plus complete specifications on "U. S." Jar Mills
WRITE FOR BULLETIN 280.

104-F

PROCESS EQUIPMENT DIVISION

U. S. STONEWARE
AKRON 9, OHIO

water cooled blade. All operator control is conveniently located at the machine. This machine is also built for through-the-floor construction where a circular battery of tanks is also built into the floor for ease of loading or where low headroom is a factor.

Kinetic Dispersion Corp., Dept. PVP, 95 Botsford Place, Buffalo 16, N. Y.

HAND TRUCK
For Horizontal Movement

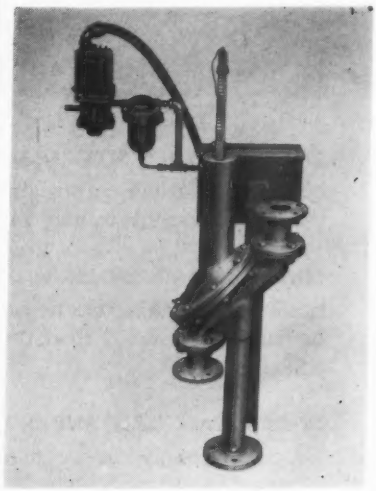
Two redesigned battery-powered "Powrworker" hand trucks for horizontal movement of loads weighing up to 6000 lbs. now available.

The units are the "Powrworker" low lift pallet truck, for use with pallets, and the "Powrworker" low lift platform truck, for use with skids. Both are available in capacities of 4000 and 6000 lbs.

Significant improvements in the low lift pallet truck come from changes in the front frame, cylinders and drive unit. Rather than the sheet metal cover previously used, the protective covering for the hydraulic system is now an integral part of the frame. Piston-type cylinders replace the old ram-type to avoid hydraulic oil seepage. Fork return springs have been placed within the cylinders to prevent damage due to corrosive conditions. The drive unit has been redesigned to provide as high as 33 to 1 gear reduction. Other changes include lift linkages which give longer life, and stronger, lighter forks.

Similar improvements have been made in the front frame, cylinders and drive unit of the "Powrworker" low lift platform truck, and in addition the lift linkage and trail frame have been completely redesigned. This machine now has five inches of lift rather than the normal four inches, and the unit is offered with platform downheights of 6, 9, and 10¾ inches to accommodate various skid sizes.

Industrial Truck Division, Clark Equipment Co., Dept. PVP, Battle Creek, Mich.



MILTON ROY

VOLUME PUMP
For Slurries or Solutions

A controlled volume pump, utilizing the Oliver Diaphragm Slurry Pump design principles, has been made available.

Modifications to the O. D. S. pump include the inclination of the pump chamber to eliminate entrained air from the body automatically. Also, to obtain highest slurry metering accuracy, the modified design features especially engineered double ball check assemblies.

The new pump consists of two hemispheres clamped together with a slack diaphragm between. The lower hemisphere is equipped with inlet and outlet check valves. The

upper hemisphere is connected to an air supply by means of a three-way solenoid valve which alternately pressurizes and exhausts the chamber. A timer electrically operates the three-way valve.

When the upper hemisphere is exhausted, suction pressure forces liquid into the lower hemisphere through the suction ball checks. This action displaces the diaphragm upward. When the upper hemisphere fills, it is pressurized, and the downward movement of the diaphragm forces the liquid from the lower hemisphere through the discharge ball checks.

By an easy adjustment of the timing mechanism, it is possible to vary flow volume from 0 to 180 gallons per hour. In addition, stroke length can be regulated by a unique electrical probe mechanism.

Milton Roy Co., Dept., PVP, 1300 E. Mermaid Lane, Philadelphia 18, Pa.

SPECTROPHOTOMETER
Double Beam

A new double beam, automatic recording infrared spectrophotometer, said to incorporate the most advanced spectroscopic features, has been developed.

Among the features unique to the new Model 221 spectrophotometer are an automatic gain control system and a programmed scanning speed system.

There are two primary modes of operation with the Model 221, automatic and cycle. In the automatic mode, at the end of a preset wavelength interval, the instrument will run back to the starting point with the pen off the paper and stop.

In the cycle position, the instrument will run back to the starting point and then repeat the scan as often as desired. This mode is particularly useful for kinetic studies, or for determining the effect of ultraviolet light in decomposing a sample or causing a reaction to progress.

The spectrophotometer scans a spectral range from 1.0 to 15.5 microns with standard NaCl optics, and a range from 0.5 to 38 microns

NEW MATERIALS EQUIPMENT

with other available prisms and interchange assemblies. With standard NaCl optics, accuracy is ±0.015 microns, reproducibility is ±0.005 microns, and resolving power is 0.02 microns at 12 microns.

Stray radiation is less than 2% at 15 microns with automatic filter, and less than 0.1% at 9 microns with automatic filter. Transmittance responsibility is ±0.5%.

The instrument size is 39" long by 16" wide by 22" high, with external power supply and amplifier.

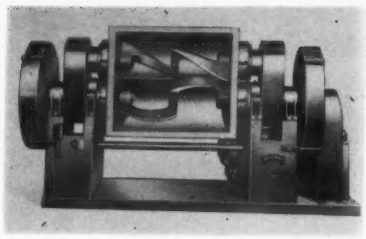
The only services required are electrical—117 volts, 60 cycles current.

Perkin-Elmer Corp., Dept. PVP, Norwalk, Conn.

MASS & PASTE MIXERS
Double Rows of Bearings

A new line of mass and paste mixers reported to embody several improvements in design and construction which assure long service under severe operating conditions, freedom from contamination, and a minimum of maintenance and lubrication.

These new mixers have double rows of lifetime lubricated bearings, located to give the shafts maximum effective support for complete rigidity. These bearings are of the extremely low-friction type and can be used at elevated temperatures, if necessary.



PAUL O. ABBÉ

Improved seals assure freedom from contamination. Precision-bored housings for the bearings and seals provide accurate alignment which is built-in for the life of the mixer. The seals are easily accessible for maintenance.

Gears are protected from dust and dirt by guards which remain in place whether the bowl is in the mixing or the dumping position. The gears may be lubricated through doors in the guards.

The particular model shown has a mixing capacity of 150 gallons and is equipped with a double end drive. The bowl is tilted for discharge by means of a hydraulically operated dump.

Such features as jacketed mixer bowls, vacuum or pressure covers, and several different types of blades can be furnished.

Other sizes from 3 to 300 gallons are made in various materials of construction.

Paul O. Abbé, Inc., Dept. PVP, 239 Center Ave., Little Falls, N. J.

PVAc RESIN
High Degree of Carboxylation

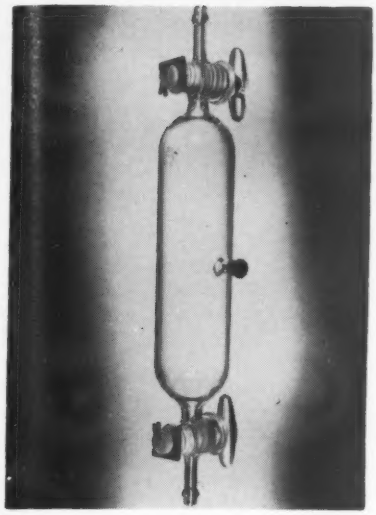
A new carboxylated polyvinyl acetate copolymer resin in now available in commercial quantities.

Designated Gelva M-7 V-100R, the new resin is said to have a higher degree of carboxylation than standard polyvinyl acetate copolymer resins. In addition, the new resin offers enhanced heat resistance and higher solution and melt viscosities. Although the resin is not soluble in alkali, films from organic solvent solution may be dispersed by the use of strong alkalies.

Gelva M-7 V-100R is suggested primarily for use in formulating paper adhesives.

Shawinigan Resins Corp., Dept. LSJ-PVP, Springfield 2, Mass.

NEW MATERIALS — EQUIPMENT



FISHER

GAS SAMPLING TUBE
For Chromatography

"Side-Draw" chromatographic gas sampling tube has been made available.

The tube holds 250 ml and has stopcocks at both ends for filling with a gas sample in the usual way. A short side-arm, with a self-sealing rubber cap, does the rest. The operator merely thrusts the needle of the syringe through the cap, draws out as much gas as needed.

Fisher Scientific Co., Dept. PVP, 384 Fisher Building, Pittsburgh 19, Pa.

PIGMENT BASE
Soft Surfaces & Transparency

A new printing ink base and pigment base, "Lake Alumina" now available.

Lake Alumina is a form of hydrated alumina said to have many advantages as a pigment been over the standard alumina hydrates. It is the best base available as far as transparency is concerned and has a soft surface to aid overprinting.

Aceto Chemical Co., Inc., Dept. PVP, 40-40 Lawrence St., Flushing 54, N. Y.

STAPLER
For Closing Filled Cartons

New "Clip-Top" Packer—Model P—(pneumatic) closes filled cartons from the outside with king-size staple clips.

In addition, this machine sets-up empty containers, ready for packing. It seals any ordinary box for less than 1/3 of one cent.

Design uses a diaphragm chamber which requires no lubricator, no filter, nor regulator, because it has only one moving part which develops no friction.

The adjustable anvil staples A, B, or C flute corrugated board. A simple twist of the adjustor screw automatically controls the staple clip for any flute thickness.

Container Stapling Corp., Dept. PVP, 27th St. & I. C. R. R., P. O. Box 247, Herrin, Ill.

AEROSOL SPRAY BUTTON
With Impressed Arrow

A newly developed aerosol spray button, which has been designed to meet problems prevalent in the paint industry, has been introduced.

The new button incorporates an impressed arrow in a second color so that the direction of spray flow can be seen instantly. The impressing and coloring of the arrow is an integral part of the molding operation and can therefore be made available at practically no increase in cost over conventional buttons.

Precision Valve Corp., Dept. PVP, Yonkers, N. Y.

PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Highway Paint

U. S. Patent 2,879,171. Fred J. Kullenberg, Millbrae, Calif., assignor to W. P. Fuller & Co., San Francisco, Calif., a corporation of California.

A new paint consisting essentially of the combination of separate non-coalescing reflecting particulate material having an average diameter of about 3 to 10 mils carried in a medium of a stabilized aqueous dispersion of a pigmented coating composition whose particles exceed 50 microns in size substantially larger than emulsion size but do not coalesce, whereby when said medium dries on a surface said coating composition physically retains said particulate material while exposing the bulk of said particulate material to view.

Paint Base

U. S. Patent 2,877,130. Maurice Caron and Ralph E. Etheridge, Maple Grove, Quebec, Canada, assignors to Walter B. Jamieson.

A liquid transparent paint base having no hiding power and suitable for mixing with liquid pigment concentrate to provide a paint giving hiding power, consisting essentially of a hiding-pigment-free dispersion of from 22% to 56% by weight of extender pigment in a film forming vehicle and a solvent for said film-forming vehicle, and said film-forming vehicle being selected from the group consisting of drying oils, resins, and mixtures of drying oils and resins present in an amount such that the base has a solid content within the range of from 12% to 40% by weight, the base having a P.V.C. within the range from 20% to 62%.

Composition For Insulating Covering

U. S Patent 2,878,133. Augusto Uccelli, Como, Italy.

A composition of matter for use in the production of an insulating covering, comprising a paste consisting essentially of a dry mix of from 30 to 80 parts by weight of asbestos fibres, from 10 to 70 parts by weight of hydraulic cement, and from 5 to 30 parts by weight of bentonite activated with from 2 to 5% sodium carbonate, said dry mix being placed and stirred in a solution of hydrogen peroxide and water to form said paste, with said hydrogen peroxide and water being present in the ratio of about 1 part by weight of hydrogen peroxide to 14 parts by weight of water.

Coating For Protecting and Decontaminating Surfaces

U. S. Patent 2,877,131. Donald C. Overholt and Merlin D. Peterson, Oak Ridge, Tenn., assignors to the U.S.A. as represented by the U. S. Atomic Energy Commission.

A process for protecting and decontaminating a surface which is subject to radioactive contamination which comprises coating said surface, prior to contamination thereof, with a coating material comprising a water-soluble carbohydrate, a hygroscopic metal halide, and water, and, subsequent to contamination of the resulting coated surface, removing said coating and the radioactive contamination associated therewith by washing with water.

Stabilized Liquid Coating

U. S. Patent 2,876,207. Loran A. Henderson, Drexel Hill, Pa., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del., a corporation of Delaware.

A liquid coating composition characterized by viscosity-stability and resistance to gelation consisting essentially of (A) at least one oily polymer of butadiene-1,3 having a molecular weight from 700 to 20,000 and selected from the group consisting of (1) homopolymers of butadiene 1,3, (2) copolymers of butadiene 1,3 and styrene, the proportion of copolymerized butadiene 1,3 being at least 75% by weight of said copolymer, (3) said homopolymers (1) and said copolymers (2) modified with a minor amount of maleic anhydride and (4) said homopolymers (1) and said

Answer for Tough Covering Jobs—RHOPLEX AC-33

Here's a way you can give painters an answer to one of their biggest and oldest headaches. Paints formulated with RHOPLEX AC-33 100% acrylic emulsion will cover old and new masonry surfaces, stucco, asphalt, asbestos shingles, previously painted wood, and almost any other exterior material.

Performance of paints made with RHOPLEX AC-33 on tough-to-paint surfaces has been proved by over five years of actual service in all climates from northern Canada to the tropics and in 32 foreign countries. Full test data on the outstanding record of RHOPLEX AC-33 in exterior paints appear in *Progress Report No. 5*. Ask for your copy today.

Chemicals for Industry

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

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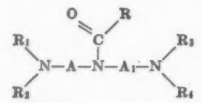
RHOPLEX AC-33

copolymers (2) modified with a minor amount of citraconic anhydride, said anhydrides being present in an amount no greater than 2% based on the weight of said polymers (1) and (2), (B) a substantially non-volatile organic-solvent-soluble organic metal compound selected from the class consisting of orthotitanate esters and orthozirconate esters in an amount from 1% to 15% based on the weight of (A), (C) a volatile liquid organic mutual solvent for (A) and (B) having a boiling range within the limits of 80°C. to 220° C. and consisting essentially of at least one hydrocarbon solvent, and (D) an aliphatic monohydric alcohol in a stabilizing amount from at least 30% to about 400% based on the weight of said organic metal compound, component (B), the non-volatile content being from 10% to 70% by weight of composition.

Asphaltic Compounds and Additives

U. S. Patent 2,875,083. Leonard J. Armstrong, Cleveland Heights, and Anton Mudrak, Cleveland, Ohio, assignors to The Harshaw Chemical Co., Cleveland, Ohio, a corporation of Ohio.



U. S. Patent No. 2, 875,083.

As new compositions of matter, mixtures of asphalt with from 0.1 to 6.0% by weight of the asphalt of an additive, said additive being selected from compounds of the formula wherein R is a radical selected from the group consisting of alkyl and alkenyl radicals having 11 to 21 carbon atoms, R_1,R_2, R_3 and R_4 are alkyl radicals having from 1 to 4 carbon atoms, and A and A_1 are alkylene groups having from 2 to 4 carbon atoms.

Quick-Drying Oleoresinous Coating

U. S. Patent 2,878,198. Alvin R. Ingram, Glenshaw, and Charles N. Irvine, Pittsburgh, Pa., assignors to Koppers Co., Inc., a corporation of Delaware.

A process of producing an oil-scluble resin comprising: condensing a p-alkylphenol wherein the alkyl group contains at least 4 carbon atoms and formaldehyde in the presence of an alkaline catalyst at a temperature of from room temperature to reflux temperature until substantially all of the formaldehyde has reacted to form a reaction mixture containing a p-alkylphenol-formaldehyde condensation product; and thereafter reacting resorcinol at a temperature of from about 50°C. to reflux temperature with said reaction mixture for a period of time sufficient to react the resorcinol with said condensation product; said resorcinol, p-alkylphenyl and formaldehyde being reacted in the molar ratio range of from 0.01:0.99:0.50 to 0.65:0.35:0.85 respectively.

Water Repellent Silicon Compounds

U. S. Patent 2,877,201. Louis F. Bonza, La Crescenta, and Frank W. Thomas, Burbank, Calif., assignors to Lockheed Aircraft Corp., Burbank, Calif.

A water repellent compound which is the reaction product of (*a*) a hydrocarbon-solvent soluble silicon compound selected from the group consisting of monosilanes, linear polysilanes and linear siloxanes, said monosilanes having the valences of the silicon atom of each silane satisfied by halogen and monovalent radicals selected from the group consisting of monovalent hydrocarbon oxy radicals containing at most 40 carbon atoms in their chains, and chloroalkyl radicals containing at most 10 carbons in their chains, at least three of the valences of said silicon atoms of each monosilane being satisfied by halogen and monovalent aliphatic hydrocarbon radicals, said polysilanes and said polysiloxanes having the valences of the silicon atoms of their polysilane and polysiloxane structures satisfied by halogen and monovalent aliphatic hydrocarbon radicals containing at most 20 carbon atoms in their chains, said siloxanes having at most 12 silicon atoms in their molecules, said polysilanes having at most 22 silicon atoms in their molecules, and (*b*) a linear aliphatic hydrazine compound having at least one functional hydrogen atom attached to each nitrogen atom, the silicon and hydrazine compound being in the proportional range of from 1:5 to 5:1 moles, dissolved in from 10 to

1,000 parts by weight of the total silane and hydrazine compound of a liquid hydrocarbon reaction medium having a boiling point of from 100 to 350 degrees F.

Modified Drying Oil

U. S. Patent 2,872,332. Richard A. Grifo, Easton, Pa., and Raymond L. Mayhew, Phillipsburg, N. J., assignors to General Aniline & Film Corp., New York, N. Y., a corporation of Delaware.

A drying oil composition containing from about 0.1 to 10% of a thixotropic and thickening agent to cause at least a partial gellation thereof ,said agent consisting of at least one N-substituted-γ-hydroxycarboxylic acid amide having the following general formula:

$$\left[SiO_{\left(\frac{4-x}{2}\right)}(OR)_x\right]_n$$

wherein R represents a member selected from the class consisting of hydrogen and methyl groups, R^1 represents a member selected from the class consisting of alkyl radicals containing from 10 to 22 carbon atoms, aryl and aralkyl radicals containing from 7 to 24 carbon atoms, R^{11} represents a member selected from the class consisting of hydrogen, an alphatic radical containing from 10 to 22 carbon atoms, an alkyl and aralkyl radical containing from 7 to 24 carbon atoms, the total number of carbon atoms consisting the groups in both R^1 and R^{11} being at least 10 and not more than 24 carbon atoms.

Organosilanols & Products Of Their Condensation

By B. N. Dolgov & V. S. Chuganov, "Vestnik Lenin-gradskogo Universiteta," No. 16, "Seriia fiziki i khimii," 3:89-98, 1958.

Examination of the formal resemblances and main differences between some silanols and those of carbinols which have the same structure. The most typical condensation reactions of these silanols with some organic compounds are observed; reactions of some trialkyl (aryl) silanols with Si halides in presence of Na are described.

Process of Making Varnish

U. S. Patent 2,875,080. Donald C. Ewart, Wilkinsburg, and Ernest G. Sieber, Pittsburgh, Pa., assignors to Airflo Roofing Co. of America, Inc., Pittsburgh, Pa., a corporation of Pennsylvania.

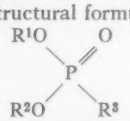
A varnish comprising 15% to 19% gilsonite, 18% to 34% of 180°F. asphalt, 9% to 12% bodied linseed oil, 6% to 8% bodied soybean oil, and 35% to 40% mineral spirits.

Flame Resistant Polyester Resin

U. S. Patent 2,877,204. George Bliss

Duhnkrack, Harrison, and Charles Hosea Dugliss, Yorktown Heights, N. Y., assignors to American Cyanamid Co., New York, N. Y., a corporation of Maine.

A composition of matter which comprises a polymerizable unsaturated linear polyester obtained by the esterification of an alpha, beta-ethylenically unsaturated polycarboxylic acid and a saturated dihydric alcohol, a copolymerizable monomer containing a $CH_2=C<$ group and having a boiling point of at least 60°C. and a phosphonate having the structural formula:



wherein R^1 and R^2 each represents a hydrocarbon radical selected from the group consisting of alkyl, cycloalkyl, aralkyl and aryl and R^3 is a radical of the group consisting of monohalogenated and dihalogenated methyl radicals.

Polyvinyl Halide

U. S. Patent 2,877,203. Alan K. Forsythe, Manor Township, Lancaster County, and John A. Parker, Lancaster Township, Lancaster County, Pa., assignors to Armstrong Cork Co., Lancaster, Pa., a corporation of Pennsylvania.

A binder system for surface covering materials comprising about 48-62% by weight polymerized vinyl halide and about 52%-38% by weight of sulfur-curable polyester oxidized with oxygen to a soft, tacky, semi-elastic gel, said polyester being the reaction product of a saturated glycol having 4 carbon atoms ,a saturated dicarboxylic acid having a carbon chain of 6-10 carbon atoms, and a dicarboxylic acid possessing a single olefinic unsaturated bond and 4-8 carbon atoms, said usatrated acid and said unsaturated acid being present in a mole ratio of about 2:1, said reaction product having an acid number in the range of about 2-15 and a hydroxyl number in the range of about 20-45.

Freeze Stabilized Polymeric Latex Coatings

U. S. Patent 2,884,397. Donald J. Berenschot and Sidney N. Pinhasik, Chicago and Karl M. Bierman, Park Forest, Ill., assignors to Armour & Co., Chicago, Ill., a corporation of Illinois.

A water-base emulsion type coating composition of improved freeze resistance containing a dispersed phase having present therein a polymeric latex wherein the polymer is selected from the group consisting of a styrene-butadiene copolymer and a butadiene-acrylonitrile copolymer, an aqueous phase, and at least about 0.10% by weight based on the latex solids of a compound having the formula $RNHCH(CH_3)CH_2COOM$ wherein R is an aliphatic hydrocarbon radical having from 8 to 18 carbon atoms and M is an alkali metal selected from the group consisting of sodium and potassium.

Water Reducible Texture Paint

U. S. Patent 2,880,104. Edward C. Scholl, Hasbrouck Heights, N. J., assignor to United Gilsonite Labs., Scranton, Pa., a corporation of Pennsylvania.

A water reducible powdered texture paint composition which consists of:

	Parts
Magnesium silicate, approximately	68-77
Hydrated aluminum silicate, approximately	66-74
Potassium aluminum silicate approximately	53-60
Calcium carbonate, approximately	30-38
Titanium calcium pigment, approximately	15-20
Water soluble cellulose ether compound (consisting essentially of approximately 55% by weight high viscosity methylcellulose ether, approximately 36% by weight sodium chloride, approximately 8% by weight glycolate, and approximately 1% by weight of sodium carbonate and sodium bicarbonate), approximately	5-10
Sodium pentachlorophenate, approximately	1- 3
Borax, approximately	1- 3
Soybean meal, approximately	30-40

W. B. Childs, Crane & Breed Casket Co., Cincinnati, Ohio, and G. N. Bruxelles, Hercules Powder Company, examine a metal casket finished with a complete lacquer system. Metals used in the manufacture of these caskets and finished with lacquer include steel, zinc, copper, bronze, and fiberglass.

WHY DO CRAFTSMEN SELECT NITROCELLULOSE LACQUER?

"Pride of workmanship has been our most important objective since this firm was established in 1853," says Bernard J. Slaughter, president of Crane & Breed. "Our product must be perfect in every way, especially appearance. We obtain this with lacquer and gain many other benefits.

"It's fast. It has good flow. It can be touched up readily. Other types of finishes would have to be stripped completely in order to repair a marred or damaged spot. It doesn't require baking—9 minutes force dry is all that is required before polishing. Baking at high temperatures or for longer periods of time can cause warpage. With lacquer, we get color effects which are not possible with other types of finishes.

"We offer about 80 color combinations, each of which can be custom produced from prime coat to the ready-to-ship condition including upholstering in less than four hours."

Cellulose Products Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

CL59-9

TECHNICAL Bulletins

RADIATION

A 12-page booklet on the use of x and gamma rays for nondestructive inspection and product testing has been published by Picker X-Ray, Corp., Dept. PVP, 25 South Broadway, White Plains, N. Y., for industrial firms that make or market any product that needs "looking into" for quality control.

The illustrated booklet, entitled *Are You In This Profit Picture?* considers the advantages and disadvantages of both x-radiation and gamma radiation for inspection purposes and answers questions most frequently asked about each.

Included in the booklet are examples of current industrial applications of x-ray and radioisotope machines used in foundries, factories, airframe construction and maintenance, shipbuilding, and for various specialties.

One section of the new publication deals with the effects of radiation on a product to improve its quality or to reduce production costs. Charts show the physical, chemical, and biological effects of various dosages of radiation.

ALUMINUM SILICATE PIGMENTS

The basic properties of the company's full line of standard-grade aluminum silicate pigments are described in a technical bulletin published by the Minerals & Chemicals Corp. of America, Dept. PVP, Menlo Park, N. J.

These non-hygroscopic mineral products are widely used in adhesives, paints, plastics, printing inks, rubber and as conditioning agents in many other chemical products.

The four-page bulletin describes the complete properties of twelve series of ASP products. The data, provided in tabular form, give both physical and chemical characteristics, such as chemical analysis, per cent residue, oil absorption, color, refractive index, specific gravity, bulking value, pH and free moisture content of each. Particle size of each series is shown graphically in a particle size distribution chart.

PUNCHED-CARDS

Publication of a new brochure describing how the Synchro-Tape typewriter cuts punched-card costs has been published by Remington Rand Division of Sperry Rand Corp., Dept. PVP, 315 Fourth Ave., New York 10, N. Y.

The four-page brochure, RT 8905, illustrates and explains the techniques by which the Synchro-Tape unit eliminates the manual jobs of card punching and verifying There is only one step requiring an operator, and even this step may be largely automatic when coded tapes are used to type repetitive details automatically while the first document of a new transaction is being written.

SODIUM FORMATE

Sodium formate, a low molecular weight, water soluble crystalline powder for pH control, is the subject of a new eight-page booklet published by Heyden Chemical Division, Heyden Newport Chemical Corp., Dept. PVP, 342 Madison Ave., New York 17, N. Y.

Product specifications, typical properties, and characteristics are covered in the booklet with particular emphasis on the material's diverse uses.

Buffer application economies as high as 50-60 per cent, the booklet notes, have been reported by manufacturers switching to sodium form-

ate from other buffer salts, such as sodium acetate.

The booklet describes how the buffer salt costs are reduced, discusses the upgrading of tanning process uniformity, inhibiting oil-well corrosion, and adding washability to wall paper among other applications.

Some applications outlined by the booklet for sodium formate include: catalysts, humectants, plating bath buffer and brightening agent, "noble" metals precipitant, photographic print coupling accelerator, green fodder preservative, and deaminating agent for dyestuff production.

DECORATING

The Dow Chemical Co., Dept. PVP, Midland, Mich. has published a 20-page booklet entitled *Make A Date To Decorate.*

The booklet—a six-step guide and text—is Dow's latest contribution in a consumer education program to build the latex paint market.

The booklet invites users to put their rooms on trial, to analyze colors and furnishings and make color selections, to create a new room in miniature, to take a good look at the budget, then to decorate. Step-by-step photographs and decorating tips tell how.

Four pages of cutouts representing basic furniture shapes allow homemakers to lay out scale model rooms on graph paper.

PHTHALIC ANHYDRIDE

A folder entitled *Phthalic Anhydride* has been made available by Reichhold Chemicals, Inc., Dept. PVP, RCI Building, White Plains, N. Y.

Phthalic anhydride is defined and applications are listed.

Specifications, properties, and packaging information of the firm's phthalic anhydride are given in chart form. Methods of handling are also included.

HAND PUMPS

Four new four-page brochures and two two-page units describe the complete line of internal gear rotary pumps offered by the Wayne Pump Company, Division of Symington Wayne Corp., Dept. PVP, Griffin Street, Fort Wayne, Ind.

Each four-page folder is color coded for one of the standard pump series: A, B, C, and D. Separate two-page monographs are included for description of the steam jacketed Series E and for Series C and D in 200 and 300 GPM capacities.

A typical cover format for the four-page units provides the pump user with typical liquids applicable for the series and typical drawings of V-belt, direct and gear driven assemblies.

Inside pages contain a descriptive paragraph, construction options and details, specifications for each model in the series, odering instructions, assembly recommendations depending on application, and dimensional details of the pump. The back page provides dimensions for V-belt and gear driven assemblies.

ODOR MASKS

A brochure entitled *"A to Z" Odor Mask for Difficult Deodorizing* has been made available by Dodge & Olcott, Inc., Dept. PVP, 180 Varick St., New York 14, N. Y.

The bulletin lists descriptions, properties, and major applications of the mask.

Miscellaneous applications and types available are also outlined.

CHROMATOGRAPHY

New Burrell Catalog 84, which lists and describes more than 134 instruments and accessories available for gas and vapor chromatography, has been made available by the Burrell Corp., Dept. PVP, 2223 Fifth Ave., Pittsburgh 19, Pa.

In addition, 158 different listings of partitioning agents are offered. This represents the largest collection of chromatographic instrumentation to be presented in a single volume thus far.

Featured in the publication is the Burrell Kromo-Tag, referred to as the most effective and versatile instrument of its kind for separating gas mixtures and certain liquid or solid compounds into component parts by elution chromatography. Listed also, is the Burrell Fraction for analysis by displacement.

Fifty-two pages of information include an introduction to gas and vapor chromatography, a description of the Kromo-Tog flow system, a review of temperature programming and curves of typical analyses.

Photographs and drawings of instruments and accessories are accompanied by descriptions and ordering information.

PACKAGING

Helpful information on selection of the proper corrugated packaging for a new or existing product is detailed in the completely revised edition of *How To Pack It*, published by Hinde & Dauch, Dept. PVP, Sandusky, Ohio.

The 32-page, fully-illustrated book contains two sections: one devoted to basic corrugated box designs, the other to special corrugated box designs.

The first section on basic designs provides a starting point in determining which box style—with or without minor variations—is best suited for individual products. Such styles as the regular slotted box, telescope box, and five-panel folder are described and illustrated.

The second section on special corrugated box designs illustrates and details 56 box designs developed in response to specialized product and marketing requirements. Special designs shown range from a simple one-piece folder to an unusual octagonal box for shipping hose, conduit, rope, and similar products.

FILTERS

Komline-Sanderson Engineering Corp., Dept. PVP, Peapack, N. J. has made available a 10-page bulletin entitled *Filters for Industry.*

Charts, tables, and photographs are contained in this literature.

Filter description and operation is discussed, construction features are outlined, and specifications are listed.

Sections are devoted to drum filters for industry, continuous precoat filters, pilot plant filters and testing facilities, and horizontal vacuum filters.

MELAMINE RESIN

Technical Bulletin SC-33, covering the description and specifications of a new melamine-formaldehyde resin designated 3560-65 Super-Beckamine, has been made available by Reichhold Chemicals, Inc., Dept. PVP, RCI Building, White Plains, N. Y.

RED PIGMENTS

Pigment News, Vol. 4, No. 1, published by the American Cyanamid Co., Pigments Division, Dept. PVP, Bound Brook, N. J., has been made available.

New Books

A Glossary of Pigments, Varnish, and Lacquer Constituents

By J. H. Martin and W. M. Morgans. Published by the Chemical Publishing Co., Inc., Dept. PVP, 212 Fifth Ave., New York 10, N. Y. 112 pages. Price $3.50.

This glossary consists of two sections. Section one is devoted to pigments. Section two is devoted to the varnish and lacquer industries.

Detailed descriptions are given of the raw materials, processing steps, and intermediate and finished products that occur in these industries, including the most recent terminology.

For easy reference all items are arranged in alphabetical order and ample cross references are included.

The book will be of assistance not only to manufacturers, chemists, technologists, purchasing agents, and salesmen of these industries, but also to beginners and students who plan to make varnish- and lacquer-making their career.

Organic Silicon Compounds

By K. A. Andrianov. Available from OTS, U. S. Department of Commerce, Washington 25, D. C. 920 pages. $10.

A comprehensive study of the chemistry and uses of organosilicon compounds by a leading Russian authority has been translated by the U. S. Air Force.

The monograph was prepared by chemist K. A. Andrianov from information drawn from the literature to mid-1954 and from his own experience in the practical development of the versatile, relatively new material. It was intended for use by Soviet scientists, engineers, technologists, and students.

Covered in the 920-page book are methods of preparation and the physical and chemical properties of large numbers of both monomeric and high-polymer organosilicon compounds. Uses of the compounds in such fields as electrical materials, metals coatings, lubricants and hydraulic fluids, plastics, precision castings, and textiles are discussed.

1958 Book of ASTM Standards, Part 8

Published by the American Society for Testing Materials, Dept. PVP, 1916 Race St., Philadelphia 3, Pa. 1632 pages. Price $12.

Pigments, oils, and thinners; drying oils and driers; shellac, varnish and varnish materials; resins and resin solutions; lacquer and lacquer materials; paint tests; traffic paints; paint weathering tests; putty; printing ink; bituminous emulsions; naval stores; coal; coke; aromatic hydrocarbons; antifreezes; and gaseous fuels are discussed.

Field Applied Paints and Coatings

Published by the Building Research Institute, National Academy of Sciences, Dept. PVP, 2101 Constitution Ave., Washington 25, D. C. 150 pages. Price $5.

Affording the building industry a chance to catch up with the rapid and drastic changes in paints and coatings during the past 10 years, the newest book published by the Building Research Institute assembles under one cover all of the latest information on the paints themselves, methods of application, causes of deterioration, and techniques for maintenance.

Field Applied Paints and Coatings, NAS Publication 653, contains the complete report of the BRI conference on this subject, held in Washington last December. There are well illustrated presentations by 18 of the nation's top authorities on paints, coatings and their use in buildings, plus the transcript of five panel discussions in which builders, architects, engineers and maintenance men posed their own questions for the experts to answer.

Special consideration is given to paints for industrial use, including high humidity, high temperature and severe chemical exposures. There is also a section on color, describing the functional use of color, and the effect of color on

the performance of the paint. And last, the future of paints and coatings. . . what we want and need for tomorrow. . . is presented from the standpoint of the building industry and of the paints and coatings industry.

Polymers and Resins

By Brage Golding. Published by D. Van Nostrand Company, Inc., Dept. PVP, Princeton, N. J. 744 pages. Price $15.

In one convenient, comprehensive volume this new book covers the theory, chemistry, properties, manufacture, fabrication, and application of all commercial polymers and resins. Not only plastics, but fibers and elastomers as well, receive up-to-date and accurate treatment. Emphasizing commercially useful polymers, the author classifies substances by chemical type and similarity rather than by physical end use and avoids the grouping of chemically unrelated substances which happen to be useful in a particular field (elastomers, for example).

The organic chemistry involved in manufacturing the materials needed for polymer production is covered in considerable detail, since recent commercial reactions can otherwise be found only in widely scattered sources.

For engineers, the chapters on fabrication and applications are especially valuable. Presented carefully and in detail, they enable you to make intelligent guesses about the composition and probable method of fabrication of everyday commercial polymeric products. An important chapter on physico-chemical behavior also delves into the relationship between molecular configuration and the differing properties of various polymers.

For convenience the author has devised logically consistent sequences, classifications, and terminology. No matter what your special interest in the field, you will find reference to it here. A monumental volume, with many line drawings and photographs of continuing usefulness in the plant, laboratory, or classroom by chemists, engineers, and students today.

Reference Index of the Current Protective Coatings Specifications

Published by OTS, U. S. Department of Commerce, Washington 25, D. C. 159 pages. Price $3. Order PB 151166.

Federal, military, and contractor specifications for numerous protective coatings including those for aircraft, paints, metal platings, ammunition, tubing, and wheel finishes are set forth in this publication in index form. Included are new specification numbers listed with the superseded or comparable specifications. Requirements, guides, and classifications accompany the specifications. Also included are charts of weights and measures, coefficients of thermal expansion, and metric equivalents.

Rapid Identification of Dicarboxylic Acids in Alkyd Resins and Polyesters

By G. G. Esposito. Published by OTS, U. S. Department of Commerce, Washington 25, D. C. 16 pages. Price $.50. Order PB 151033.

A rapid technique for identifying the eleven dicarboxylic acids commonly used in manufacturing alkyd resins, polyesters, and plasticizers was developed. Microscopic examination of crystals of the free acids formed by hydrolysis of their dipotassium salts showed distinct characteristics which can be used to obtain rapid identification of each of these acids in coating materials. Photographs, drawings, and an isolation scheme to assist in obtaining positive identification are included in the report.

A New "Spot" Test For Epoxy Resins

By M. H. Swann. Published by OTS, U. S. Department of Commerce, Washington 25, D. C. 5 pages. Price $.50. Order PB 151032.

A new, rapid "spot" test for bisphenol-type epoxy resins is described. The test is said to be useful in routine identification of synthetic resins in coating materials. It is specific, exceptionally rapid and simple to conduct, and applicable to all types of coating materials, including dried or cured films. A unique feature of this test is that no reagent is employed, other than the cellulose of the filter paper on which the test is observed

Abbé Engineering Sales Agents List

IN the March, 1959 *Review and Buyers' Guide* issue, the sales agents for the Abbé Engineering Company were omitted from the Directory of Sales Agents and Distributors, page 189.

The sales agents are as follows:

Sales Agents

CALIFORNIA
J. W. Leser Co.
4408 W. Jefferson Blvd.
Los Angeles 16

Wm. H. Edis & Associates
1485 Bayshore Blvd.
San Francisco 24

ILLINOIS
P. Jaeger Company
1749 George Court, Glenview
Chicago

MARYLAND
E. L. Rieha
634 Wicklow Road
Baltimore 29

MASSACHUSETTS
R. P. Waller
246 Walnut St., Newtonville 60
Boston

MICHIGAN
Process Controls Co.
12201 Merriman Road, Livonia
Detroit

MISSOURI
Wharton L. Peters Machinery Co.
3863 W. Pine Blvd.
St. Louis 8

OHIO
B. W. Rogers Company
850 S. High St.
Akron 9

Plant Equipment Co.
204 Union Terminal Bldg.
Cincinnati 3

P. M. Kline & Associates
2036 E. 22nd St.
Cleveland 15

PENNSYLVANIA
A. R. Amos Company
713 Commercial Trust Bldg.
Philadelphia 2

J. Guy Griffith Co.
1251 Union Trust Bldg.
Pittsburgh 19

WASHINGTON
Fred G. Greaves Co.
418 Eighth Ave., N.
Seattle 9

CANADA
Richardson Agencies, Ltd.
P.O. Box #2, Station "O"
Montreal 9, Quebec

Richardson Agencies, Ltd.
P.O. Box #8, Station "T"
Toronto 19, Ontario

Please note that the address of the Abbé Engineering Company is 420 Lexington Ave., New York 17, N. Y., and not 50 Church St., New York, N. Y., as listed on page 159 of the *Buyers' Guide*.

They're both blowguns, but...

each is in a class by itself . . . like Wyandotte's PURECAL® O

The *method* of use is the same for a pea shooter or a blowgun . . . but one is used in fun, and the other in deadly earnest. Makes all the difference in the world when you're on the receiving end!

In calcium carbonates, it's the *method* that makes the difference. And Wyandotte PURECAL O – the calcium carbonate that's in a class by itself – is precipitated by a special process which consistently yields about 20% more agglomerate-free particles per pound, of cubical shape. It is a product of exceptional purity, uniformity, and whiteness.

By replacing part (or all) of your "less-bright" fillers and extenders with PURECAL O you'll extend your pigments further. Then replace the prime pigment* with PURECAL O in 10% increments until the desired whiteness is reached. Thus, quality is improved while holding costs . . . or, costs are cut without sacrificing quality.

We invite you to try PURECAL O in your formulation. Write for samples and technical data, today. *Wyandotte Chemicals Corporation, Dept. 756-P, Wyandotte, Michigan. Offices in principal cities.*

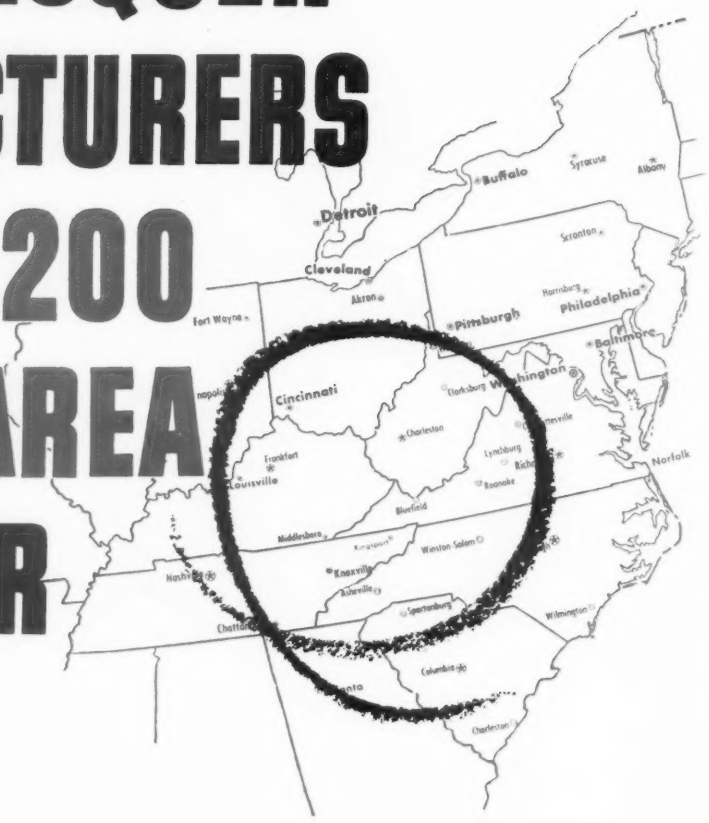
*At least 10% of titanium dioxide may be replaced with PURECAL O without apparent loss in whiteness or hiding power.

Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

PACING PROGRESS WITH CREATIVE CHEMISTRY

ISOBUTYL ACETATE SAVED LACQUER MANUFACTURERS OVER $41,200 IN THIS AREA LAST YEAR



How much can you save with this economical solvent?

A switch from n-butyl acetate to Eastman Isobutyl Acetate saves you 14¢ on every gallon, or more than $1,100 on an 8,000 gallon tank car.

A medium-boiling solvent, Isobutyl Acetate can be used interchangeably with butyl acetate in most formulations. Its substitution in nitrocellulose lacquers produces virtually no change in film properties or handling characteristics.

Replaces methyl isobutyl ketone

Substituting Isobutyl Acetate for MIBK means a saving of 5¢ per gallon ($400 per tank car) and helps you obtain better blush resistance.

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Using Isobutyl Acetate alone, the cost per gallon will in all likelihood be less than that of any usable combination of butyl acetate with sec-butyl acetate or propyl acetate. In addition, you free a storage tank for other purposes.

Your Eastman representative will be glad to show you how you can reduce your solvent costs with Isobutyl Acetate. Write to our nearest sales office or to EASTMAN CHEMICAL PRODUCTS, INC., Chemicals Division, KINGSPORT, TENNESSEE.

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foreign developments

OCCA London Exhibit

Soviet and Czech Abstracts

British paint technologists attending the recent technical exhibition sponsored by the Oil and Colour Chemists Association. For highlights of this exhibition, see page 91.

Widely Recognized as a Standard of the Industry!

Sovasol 35 is an isoparaffinic solvent that is practically odorless, water-white in color, doctor sweet, and extremely color stable. It comes to you spotlessly clean in tank cars. These qualities have made Sovasol 35 a standard of the paint industry.

For further information about Sovasol 35 and Mobil's complete line of quality aliphatics, call your Mobil representative, or write to address below.

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HIGHLIGHTS OF 11th OCCA TECHNICAL EXHIBIT

American and German manufacturers strongly represented.

THIS year's show was marked by an increase in the number of American companies, or their British associates. Among those exhibiting for the first time was Cyanamid of Great Britain Ltd. With little new to offer, the emphasis was on the development of existing products. German manufacturers were strongly represented by firms like and Bayer, Chemische Werke Huls and Rohm und Haas, especially in the polyester field where competition is getting to be very keen.

Ideas originating with the American Tung Oil Association on tung oil modified epoxy resins have been taken a stage further by the English firm of John M. Hamilton Ltd., who showed the results of their work on cooking tung oil with linseed epoxy esters. The product is said to have excellent water resistance and application properties.

Multicomponent media were the main uses suggested for Beckosol 3020 (Beck Koller & Co.), a hydrogenated castor oil alkyd produced with trimethylolpropane. This alkyd is intended for use as a plasticizer in urea and melamine resins, giving outstanding gloss and alkali resistance and in melamine/epoxy baking enamels where similar results are obtained. Other firms with trimethylolpropane alkyds were ICI and W. Mitchell and Smith.

Laporte Titanium representatives indicated that apparently paint technologists do not like 'Do-It-Yourself' methods. They had been offering the use of a stirring machine, paint knife, Hegman gauge and plenty of rags so that any comers could prove for themselves that Runa R. H. 20 (a rutile TiO_2) could be dispersed to 6 to 7 Hg by simply stirring. On the opening day of the exhibition, no vistors had taken the offer.

At the Rex Campbell Ltd. booth, the reply to questions about A.D.M's Aralon 304 was "no comment." Aralon 304 water-thinned baking primer was introduced into Britain about two months ago by Rex Campbell who thinks that not enough experience with this resin has been gained to make a statement. Elsewhere at another booth, I heard a glowing report of the adhesion properties of this new primer.

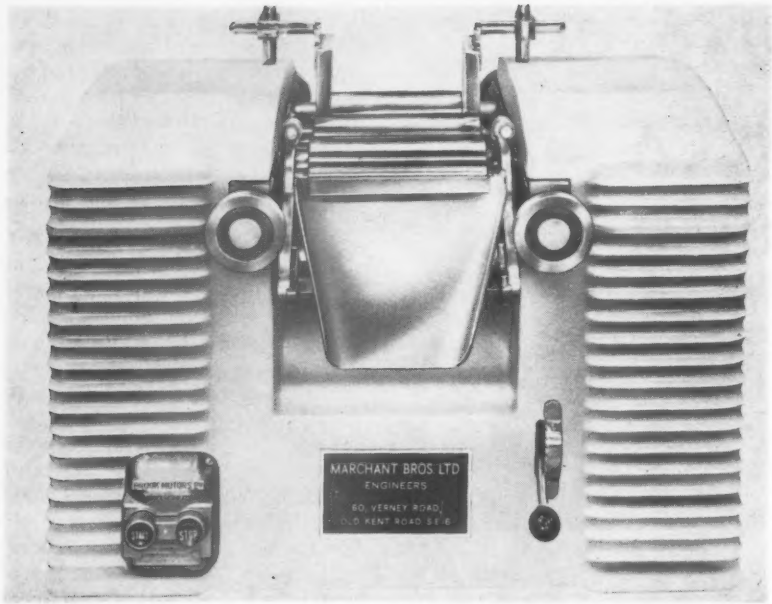
Thixotropic media were less strongly stressed than in previous years. The opinions of paint manufacturers are quite widely divided. Those who sell thixotropics have nothing but good to say but the other think that non-drip or jelly paints are a passing gimmick. An odd situation has arisen in this respect since the ICI Dyestuffs Division makes thixotropic media (their Modulacs were on exhibit) but the ICI Paint Division has not and, unofficially, will not put a thixotropic paint on the market. Beck Koller has done a great deal of development work on their thixotropic Beckogels 1480 and 1485.

Among the paint additives, Durham Raw Materials were demonstrating the potential of zirconium, barium, vanadium and cerium driers in various typical paint binders, both air-drying and baking, The incorporation of aluminium alcoholate in heat resistant paints as a gelling agent was on demonstration at the Leon Frenkel Ltd. booth.

Micafine Ltd. has developed two types of mica for use in road marking (traffic) paints. One is for bitumen surfaces where bleeding resistance is important and the other is for concrete surfaces where the main attack is from alkali.

Very little new in the way of equipment was displayed. William Boulton Ltd. showed a Podmere-Boulton "vibro energy" mill in which high frequency vibrations are applied to the grinding chamber so that it oscillates rapidly about the central vertical axis. The grinding balls vibrate and so grind the charge. Merchant Brothers had some rather neat and well designed mills on exhibit at their booth. Design features include readily cleaned hopper cheeks, total enclosure of electric parts and water cooling with visual checking of the water flow through nylon tubes.

Pictures on following page.



The new Marchant triple roll mill (6 x 3 version) with an oil immersed totally enclosed gear train drive.

The Paint Research Station of the British Paint Manufacturers' Research Association was showing exhibits relating to color assessment, matching and color tolerance.

Cyanamid of Great Britain exhibited its line of coating resins and various petrochemicals of interest to the coatings field.

SOVIET and CZECH ABSTRACTS

Anti-Corrosion Properties of Lacquers

By L. V. Nitsberg & S. V. Iakubovich, "Tezisy Dokladov i Soobshchenii Siktsii Lakokrasochnykh Pokrytii," Moscow, Profizdat, 1958.

The functions of protective coatings in water medium are to isolate the metal from the external milieu, and to passivate it. Passivation begins when the coating ceases to protect the metal from the medium. Electrolyte passage through the protective film is accompanied by a decrease in ohmic resistance in the coating.

The presence of pigments in coatings determines their passivating activity, characterized by the rise of stationary potential of the metal in water suspensions of such pigments.

The passivating action of pigments depends on their solubility, on the pH of their solution, and on the magnitude of their redox potential. In a given medium, the redox potential of a pigment is approximated by the potential of little-soluble metals. The higher the pH of the medium, and the lower the solubility of the film on metal, the easier is the determination of such potential (for example, of iron). Metal passivation may also be conditioned by a partial replacement of oxygen (in the oxidized film) by an anion of the pigment.

In acid medium, the pigment may develop a passivating activity if the film, formed on metal, has a much higher hydrogen over-voltage than the metal. Under the conditions of this study, this was the case of the lead pigments (which formed metallic Pb films on iron), and of TiO_2 (which formed a titanium film on iron).

The following conditions are necessary to reduce lead pigment to metallic Pb:

1) In a given medium, the iron potential should be more negative than that of Pb;
2) Iron should be sufficiently active;
3) The pigment, or the substances formed in the medium, should have a sufficient solubility.

In coatings which employ mixtures of pigments, the passivating action does not possess additive character; it reaches its maximum at a definite optimum ratio of pigments. This pigment proportion may be determined electrochemically.

Electrochemical investigation of a number of anti-corrosion lacquers have shown that these methods are capable of predicting material behavior in given working conditions.

Protection of Ship Shells From Corrosion

By Iu. Afanas'ev, "Morskoi Flot," Vol. 18, 12:19, December 1958.

An ethinol paint (EKZhS-40), based on divinyl acetylene lacquer and Fe oxide as pigment, is recommended by the Ministry of Sea Fleet; four layers of the paint need a total of 40 hours for application and drying. Other compositions are discussed in the light of properties and economy; the primer FP-3 is a phosphate composition prepared by dissolving hydroxyquinoline in a mixture of isoamyl and ethyl alcohols, and adding water and orthophosphorous acid; it requires two coats.

Corrosion Inhibitor Mixtures in Neutral Media

By A. S. Afanas'ev & G. V. Zhur, "Zhur. Priklad. Khim.," Vol. 32, 1:141-150, January 1959.

Studying their effect upon atmospheric and underwater corrosion of steel, the authors determined the minimum effective concentrations of the following corrosion inhibitors and of their mixtures: sodium nitrite, sodium

silicate, triethanolamine, sodium triphosphate, and emulsol. It was established quantitatively that mixtures of these inhibitors are considerably more effective than the individual substances taken in the same concentration. The mixture of Na_2Si0_3 and $NaN0_2$ containing not less than 1.5—2 g/l of these inhibitors offers full protection; taken separately, not less than 1.5—2 g/l sodium nitrite and not less than 10—25 g/l Na_2Si0_3 (always depending on type of steel) are needed to achieve such protection. An anti-corrosive mixture, containing a minimum of 0.5—1.0 g/l of triethanolamine and sodium nitrite each, is fully effective on the types of steel tested.

Adhesion Determination of Paint Lacquer Coatings

By I. I. Kletchenkov, "Zavodskaia Labroatoria," 11:1376-1377, 1958.

A new method, permitting an automatic recording of adhesiongrams, makes use of an electro-mechanical adhesion meter devised for the purpose and schematically described in the article. The method has been used for measuring adhesive properties of various organo-Si and other lacquers, and may be applied to a wide variety of paint-lacquer materials.

Solventless Polyester Lacquers

By J. Mieziva, A. Sternschuss, & S. Pokorny, "Chemicky Prumysl," Vol. 9(34), 1:50-54, January 1959.

A study of the technological properties of solventless polyester lacquers, Veros 5 and Veros 6, developed at the Research Institute for Synthetic Resins and Lacquers in Pardubice (Czechoslovakia), and their comparison with the German product Glassit 947-4. Quality of product is determined by the quantity and kind of waxy additive: the lowest inhibition was observed with paraffin (0.04%). The Czechoslovak products claim properties similar to foreign lacquers; the authors urge the replacement of common lacquers with solventless polyesters, with a resulting increase in economy and quality of wood finishing.

A Scientific-Technological Conference on Polystyrene

By A. N. Levin, "Khimicheskaia Nauka i Promyshlennost'," Vol. 3, 7:673-674, November 1958.

The Conference took place in Moscow in May 1958, in the presence of 237 participants. The contribution by P. Z. Li *et al.* described polyester-styrene resins, used as a binding component in the manufacture of glass plastics, and of interest to the paint industry as wood lacquer-coatings stable also in tropical conditions. Polyester–styrene resins may be obtained from: diethylene glycol and maleic anhydride; diethylene glycol, maleic and phthalic anhydride; ethylene glycol, maleic anhydride and adipic acid, at temperatures of 200-210°C in inert gas medium to oxidation numbers of 35-45, and with addition of some catalysts (toluenesulphoacid and Zn chloride). The unsaturated resins also harden at room temperature in the presence of an oxid.-reducing system. Other papers presented at the conference dealt with the kinetics of emulsion polymerization, coagulation of synthetic polystyrene latexes, new derivatives and copolymers of styrene, uses, properties etc.

Laticed Polymers From Saturated Linear Polymers

By A. Ia. Drinberg, "Khimicheskaia Promyshlennost'," 7:13-16, October-November 1958.

A study of the preparation, conditions and dependencies of three-dimensional polymers obtained at the expense of functional groups and radicals formed in saturated polymers in the course of energetic processes (heating etc.) The possibility to use protective coatings based on such products is indicated for multi-layer applications, where the combination with lower layer occurs by coalescence at the expense of the unconverted part of the polymer. It follows that a high degree of conversion lowers the stability of such a coating.

Effect of Degree of Dispersion on Hiding

By Z. S. Pavlova, S. I. Rubina, & M. L. Morgulis, "Legkaia Promyshlennost'," Vol. 18, 11:25-26, 1958.

Several lacquers and pigments, widely used in the leather industry, were tested

to determine the effect of vibrational grinding on the quality of coloring PVC and rubber surfaces. The results indicate that, up to a certain limit, a higher degree of dispersion of organic lacquers and inorganic pigments increases the covering power of the latter, and improves the quality of finishings on PVC surfaces. Dry vibrational grinding lowers the quality of organic lacquers, while the use of plasticizer increases the degree of dispersion and avoids aggregation of particles, thus improving the covering power of these lacquers.

Synthesis of Copolymers Of Vinyl Acetate

By S. N. Ushakov & E. M. Lavrent'eva, "Zhurnal Prikladnoi Khimii," Vol. 31, 11:1686-1691, November, 1958.

Copolymers of crotonic acid and vinyl acetate were prepared by action of benzoyl peroxide at 68-70°C. The copolymer composition approximates the proportion of the starting monomers. Its specific viscosity was found to decrease with increasing amounts of crotonic acid. Increasing the amount of crotonic acid also decreases, in identical conditions, the copolymer yield. The vitrification temperature of the copolymers depends on the nature of the substituents, and increases in the order crotonic acid—ammonium salt—amide; increasing the concentration also raises the vitrification temperature.—Copolymers of vinyl acetate with the ammonium salt of acotonic acid, and with its amide were also prepared. The analytical characterstics of the products are tabulated.

Joint Condenstation of Substituted Orthosilicic Acid

By V. B. Polev, "Zhur. Priklad. Khim.," Vol. 32, 1:225-227, January 1959.

New organosilicon compounds are obtained as a result of the reaction between hydroxyl groups of polyester and functional groups of Si compounds. Glyceroadipic polyester was prepared by heating a mixture of adipic acid and excess of glycerine for 4-5 hours at 200± 2°C, with CO_2 added and water drawn off continuously. When the oxidation number fell to under 10 (from the original 340), phenyltriethoxysilane (or mixture of the latter with diethyldiethoxysilane or with tetraethoxysilane) was added, and the solution heated for another 15-20 minutes at 200°C. The resultant resin was transparent, brittle, and light-yellow in color. Lacquers, prepared by dissolving the resin in ethyl cellulose solution, possess good adhesion to brass and glass surfaces, are stable to the action of water; their films showed no apparent change after nine-day exposure, and remained elastic and transparent. No change was observed in the lacquer film after heating in thermostat at 200°C for several hours.

Oxidation of Zirconium At High Temperature

By E. S. Sarkisov, N. T. Chebotarev, A. A. Nevzorova, & A. I. Zver'kov, "Atomnaia Energiya," Vol. 5, 5:550-553, October 1958.

The study of zirconium oxidation in oxygen and in water vapor at temperature range of 150-800°C showed a number of stages. The first stage is a thin film with a high passivating ability. The second stage forms a monoclinic texture; the third stage is a black film of a cubic and monoclinic modification which passes into a white film. In the latter, the oxidation rate increases. The black film has a high corrosion stability. Tabulated results indicate that the mechanism of film formation on Zr surfaces as a result of water vapor oxidation is analogous to oxygen oxidation.

Increasing Water Stability & Life of Carbamide Resins

By R. Z. Temkina, "Derevoobrabatyvaiushchaia Promyshlennost'," Vol. 7, 11:7-9, November 1958.

A study of the conditions necessary for improving the water stability of urea-formaldehyde resins.

Chemistry of Organo-Silicone Compounds

"Chemicky Prumysl," Vol. 8, 10:558-559, 1958.

A Soviet bloc symposium, attended by 200 scientists from the USSR and other communist countries, was held in Dresden in May 1958. Brief summaries of part of the 28 papers presented.

Vincent C. Vesce To Give Annual Mattiello Talk

Vincent C. Vesce, technical director since 1924 for Harmon Colors, Allied Chemical's National Aniline Division, Hawthorne, N. J., has been selected to present the Annual Joseph J. Mattiello Memorial Lecture at the 37th Annual Meeting of the Federation of Paint and Varnish Production Clubs, which will be held in Atlantic City from October 22-24, 1959.

The subject of his lecture will be *Exposure Studies of Organic Pigments in Paint Systems.* It will be given on Friday morning, October 23rd, in the American Room of the Traymore Hotel.

The Mattiello Lecture, instituted by the Federation in 1940, commemorates the name of Dr. Joseph J. Mattiello, who, as a member of the Federation, did so much to expand the application of the science in the protective coatings field. Mr. Vesce is the eleventh outstanding scientist to receive one of the paint industry's highest honors—selection as a Mattiello Lecturer.

In the 35 years in which Mr. Vesce has served as technical director, he has been a pioneer in the development of new organic pigments, in the improvement of standard pigments, and in the expansion of the use of organic pigments, initially in the automotive industry, and later to other color-using industries.

During his career with Harmon, he has been responsible for an impressive number of achievements in organic pigment chemistry and technology. Among these are the

Vincent C. Vesce

commercial production of durable maroon and red organic pigments for the automotive industry and the first preparation of transparent colloidal iron pigments which make possible iridescent metallic finishes (USP 2,384,579). The commercialization of thioindigoid pigments in the U. S. has been an exclusive development of the Harmon laboratories under Mr. Vesce's direction. These durable red and maroon thioindigos have been the standards for fastness of the industry and Harmon's position in this field has been maintained over the past 20 years.

Mr. Vesce's development of the first commercial non-flocculating phthalocyanine blue did much to encourage the use of this desirable pigment in the entire paint industry (USP 2,327,472).

In addition to his work on special automotive pigments, the 1959 Mattiello Lecturer has pioneered in the production of soft textured easily dispersed pigments of every type for all pigment consuming industries (USP 2,268,144; 2,138,048; 2,138,049). The production of benzidine yellows and pyrazolone reds has been one of Harmon's specialties for years and it is believed that this work was also a "first" for the U. S.

In recent years, Mr. Vesce's work has been directed toward the preparation of new light fast pigments suitable for pastel coatings and in the preparation of special dispersions for specific industries. His paper on *Vivid Light Fast Organic Pigments* is familiar to the technical personnel of the paint industry through its appearance as a special supplement to the June 1956 *Official Digest*, published by the Federation, and through Mr. Vesce's presentation of this work to several Paint and Varnish Production Clubs.

During World War II Mr. Vesce collaborated with Dr. Mattiello and others in a study of the infra red reflectance of pigments. In addition to his work on organic colors for pigments and for signal smokes during the war, Mr. Vesce worked on the production of Napalm, and under his direction the first substantial production of this material was accomplished at Harmon.

He is chairman of Sub-Group VII (Red Pigments), Sub-Committee XV (Pigments) of ASTM Committee D-1 on Paint, Varnish, Lacquer and Related Products. He is a Fellow and charter member of the American Institute of Chemists, and a Fellow of the New York Microscopical Society. He is a member of the American Chemical Society, the Inter-Society Color Council, and the Chemists Club.

Mr. Vesce was born in Philadelphia in 1901 and was educated in New York City schools and the Polytechnic Institute of Brooklyn.

The Federation's 1959 Mattiello Lecture Committee which made the selection of Mr. Vesce included: Herbert E. Hillman, Chairman, (New York Club); C. A. Aloia (New York Club); S. Leonard Davison (New York Club); Emory G. Fleming (Philadelphia Club); and Gustave H. Wescott (Philadelphia Club).

NEWS

NEWS OF COMPANIES, ASSOCIATIONS
TECHNICAL GROUPS
ITEMS OF GENERAL INTEREST

Gordon Research Conferences Set

The Gordon Research Conferences for 1959 will be held from June 15 to September 4 at Colby Junior College, New London, N.H.; New Hampton School, New Hampton, N. H.; and Kimball Union Academy, Meriden, N. H.

Requests for attendance at the conferences, or for additional information, should be addressed to W. George Parks, Director, Department of Chemistry, Dept. PVP, University of Rhode Island, Kingston, R. I. From June 15 to September 4, 1959, mail should be addressed to Colby Junior College, Dept. PVP, New London, N. H.

The Organic Coatings Conference will be held July 27-31 at Colby Junior College under the chairmanship of D. F. Koenecke and S. Gusman. The program schedule is as follows:

July 27

C. E. Anagnostopoulos. *A Statistical-Thermodynamic Treatment of Polyvinyl Chloride-Plasticizer Compatability.*

Valeria Artel. *Evaporation and Diffusion Characteristics of Resin Solvents.*

July 28

J. E. O. Mayne. *The Mechanism of the Inhibition of the Corrosion of Iron Particularly by Paint.*

J. P. Simko. *Studies of Films Under Cathodic Protection Conditions.*

July 29

B. D. Beitchman. *Studies of the Mechanism of Asphalt Degradation During Weathering.*

M. E. Bailey. *Correlation of Structure and Coating Properties of Polyurethane Copolymers.*

July 30

J. F. Vitkuske. *Fundamental Colloidal Behavior of Latexes.*

M. C. Carpenter. *Practical Application of Latex Fundamentals in Formulation and Use of Latex—Based and Other Water-Borne Industrial Paints.*

July 31

H. Dannenberg. *Measurement of Adhesion by a Blister Method.*

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Drying Oil Course

The 1959 Short Course on Drying Oils sponsored jointly by the American Oil Chemists' Society and the University of Minnesota Institute of Technology will convene August 10 through August 14.

The sessions will take place at the Center for Continuation Study, a self-contained residence college of the University in Minneapolis.

Attendance is open to anyone interested in drying oils, but because of air conditioned space limits, registration will be held to 110.

The general chairman is M. W. Formo, Archer-Daniels-Midland Company; the program chairman is D. H. Wheeler, General Mills.

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Annual Canisius Infrared Spectroscopy Institute

The third annual Canisius College Infrared Spectroscopy Institute, geared to the needs of industrial personnel, will be held at the college in Buffalo, N. Y., from August 24 through 28.

Designed for those with little or no experience in the field, the program will cover the elementary and advanced theory of infrared spectroscopy, its industrial applications, and its future in research and industry.

The Institute schedule includes morning and afternoon classes, supplemented in the evenings by laboratory practice in the interprepetation of spectra and the solving of problems. Single and double-beam instruments and an extensive spectral library will be used by the participants in the college's spectroscopy laboratory.

The well-balanced twelve-man Institute staff includes three specialists from the Canisius College faculty, nationally-known visiting professors, representatives of leading instrument manufacturers, and five industrial spectroscopists.

The lecturers will be the following:

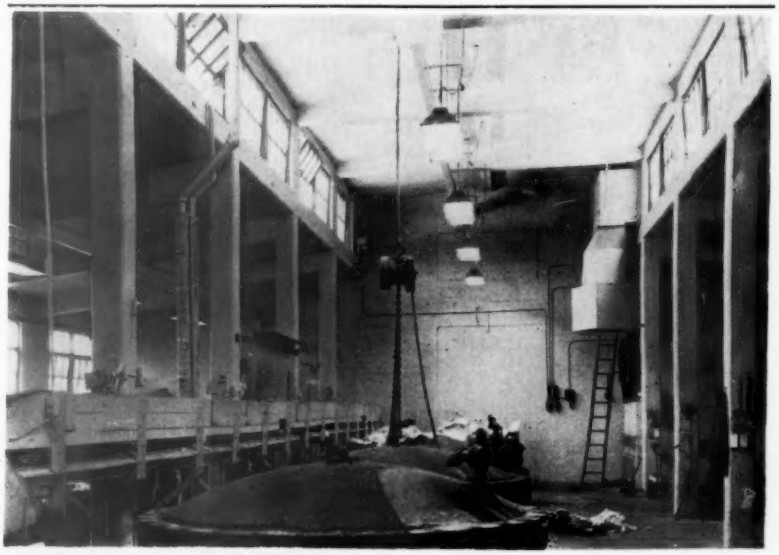
Dr. Herman A. Szymanski, Dr. Robert T. Conley, and Rev. Arthur G. Koehe, S. J., Canisius College;

Sister Miriam Michael Stimson, O.P., Ph.D., and Sister Irma Gerber, O.P., Ph.D., Siena Heights College, Adrian, Michigan;

Donald A. Herbert, western New York sales manager, Beckman Instruments, Inc.; and Dr. Raymond R. Sawyer, molecular spectroscopist, Perkin-Elmer Corp.;

Leroy H. Bille, Allied Chemical Corp., National Aniline Division; Abram Davis, Hooker Chemical Corp.; A. Sidney Ayers, E. I. duPont de Nemours & Co., Inc., Yerkes Research Laboratory; Dr. Richard S. McDonald, General Electric Co.; and Dr. Ernest R. Shull, Linde Co., Division of Union Carbide Corp.

Registrations and inquiries may be addressed to Dr. Herman A. Szymanski, Director, Infrared Spectroscopy Institute, Canisius College, Dept. PVP, Buffalo 8, N. Y.



PROTECTION AGAINST DETERIORATION: Walls and ceiling of this cotton cooker room in a large Midwest wadding and batting manufacturing plant were badly deteriorated by constant exposure to steam from 10 giant pressure cookers. During brief shut-down, maintenance contractors pointed up bad spots. After patching had dried, entire room, including all metal and woodwork, was spray-coated with primer and two coats of "Maintz" coating based on "Hypalon" synthetic rubber. Because "Hypalon" is said offer lasting resistance to moisture, aging, and chemicals, complete room and equipment are now protected.

NEWS

Paint Short Course For H. S. Chemistry Teachers

The Fourth Paint Short Course for High School Chemistry Teachers will be held at the University of Missouri School of Mines and Metallurgy at Rolla, Mo., from June 23 to 30, 1959.

This course, sponsored by the Federation of Paint and Varnish Production Clubs as part of its educational activity, has been conducted since 1956 to demonstrate to high school chemistry teachers that the manufacture of paint is a highly technical chemical industry. Another objective is to help the teachers guide their students into the fields of science and engineering. The teachers will be better informed of the present status and the future challenge of chemistry in general and of protective coatings chemistry in particular after they have completed the prescribed course of study.

Each of the Federation's 24 Constituent Clubs will select at least one teacher from within its area to attend the special session which will again be under the direction of Dr. Wouter Bosch, Professor of Paint Chemistry at the Missouri school. Dr. Bosch, formerly associated with North Dakota Agricultural College, conducted the previous three courses when he was at NDAC.

Dr. Bosch has prepared an interesting course of study. He will be assisted by two guest lecturers: Dr. J. S. Long, Director of the Federation's Paint Research Institute; and Ralph E. Pike, of E. I. du Pont de Nemours & Co. in Flint, Mich.

Laboratory experiments to be performed by each teacher have been selected to demonstrate how organic, inorganic, physical, high polymer, and colloidal principles of chemistry are utilized in the production of decorative and protective coatings. Most of these experiments will be suitable for inclusion in high school chemistry courses to provide an example of the application of chemical reactions in a manufacturing process.

The expense of the course will be underwritten by the Federation. However, many of the Federation's Clubs and/or the local Paint, Varnish and Lacquer Association Clubs have volunteered to assume all or part of the expense of sending their local representative.

•

Oronite Offers Samples

Samples of new Isophthalic-based alkyd and polyester resins are now available to resin and paint manufacturers throughout the country for evaluation and testing.

The samples, together with complete technical data on each resin, are provided by Oronite Chemical Company to assist resin and paint chemists in developing their own resin formulas. Oronite, petrochemical subsidiary of Standard Oil Company of California, pioneered the development of Isophthalic, low-cost chemical raw material used in a variety of paints, surface coatings, and plastic products.

•

Soviet Patent Bulletin

The latest technical developments from the USSR are now available in English translation, in the form of a Russian Patent Bulletin, from Research Information Service, publishers and translators of scientific and technical material, 40 East 23 Street, New York 10, N. Y.

The Bulletin, issued monthly, consists of patents announced and published each month in Russia. The title and complete text of every chief claim for each newly released patent is given for the following fields: Inorganic and organic chemicals; rubber and plastics; and fuels.

•

Rudolf G. Froiland Selected For Seminar

Rudolf G. Froiland, chemistry instructor at Anoka Minnesota High School, has been selected to represent the Northwestern Paint & Varnish Production Club at the June 23-30 Seminar for high school chemistry teachers at the Rolla School of Mines, Rolla, Missouri.

R. C. Froiland

According to M. C. Hilke, education chairman for the Northwestern Club, sponsorship of Mr. Froiland's attendance is part of a nationwide industry program to better aquaint members of the teaching profession with the need for graduate chemists in the decorative and protective coatings field.

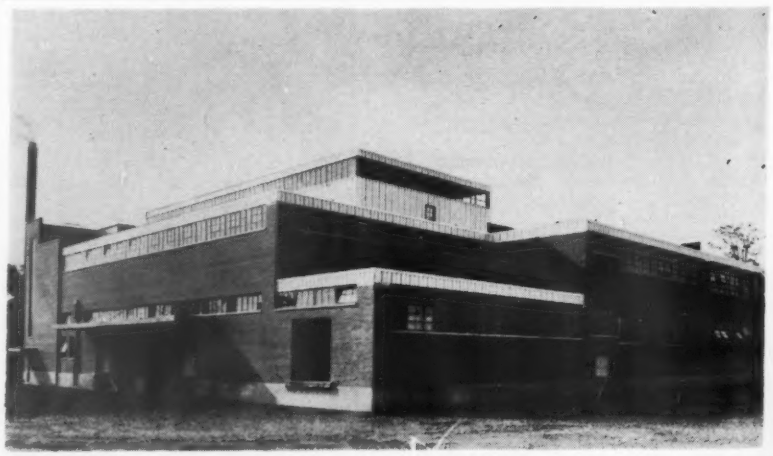
Seminar activities will include applied technology as well as laboratory experimentation and demonstration.

•

J. W. Gardiner Retires

Joseph W. Gardiner, Jr., manager of the pigment division of National Lead Company's Philadelphia branch, retired on May 1, after thirty-eight years of service.

Mr. Gardiner joined National Lead in 1921.



NEW PLANT: Morningstar-Paisley plant in Clifton, N. J., has gone on-steam with the production of polyvinyl acetate emulsions. Output of the new plant, combined with a 50% increase in the PVAc production at the company's Chicago facility, has doubled M-P's total capacity.

NEWS

Federation Invites Roon Award Papers

An invitation for the submission of technical papers for the Second Room Foundation Awards competition has been issued by the Program Committee for the 37th Annual Meeting of the Federation of Paint and Varnish Production Clubs. The deadline for the receipt of papers in August 1, 1959.

The Room Foundation Awards were established in 1957 with cash grants from Leo Roon, head of the Roon Foundation. The competition, which aims to encourage and reward the publication of technical papers that contribute to the scientific and practical progress of the protective coatings and allied industries, serves also to give public recognition to the researchers whose works are published.

There are two classes of awards, one for Class A members of the Federation, and an Open Competition for all other eligible persons. First, second and third prizes of $450, $250 and $175, respectively, will be awarded for winning papers in each class. Individuals associated with the coatings and allied industries, including those affiliated with raw material suppliers and education institutions, are eligible to submit papers. Papers by Committees of Constituent Clubs of the Federation are not eligible for these awards.

Seven copies of each paper should be sent to Mr. William L. Foy, Chairman of the 1959 Program Committee, c/0 The Foy Paint Company, Inc., Dept. PVP, 1776 Mentor Avenue, Cincinnati 12, Ohio. Abstracts of 200 to 300 words must be received prior to that date. Five members of the Federation, appointed by Mr. Howard Sholl, president, will be the judges.

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N. Y. Club Meeting

R. E. Bley, consultant on engineering techniques for E. I. Du Pont de Nemours & Co., Inc., was the guest speaker at the New York Paint & Varnish Production Club's May meeting.

Mr. Bley's paper, entitled *Surface Preparation Techniques For Protective Painting*, described the primary phases of a long life coating system, namely, coating selection, surface preparation and application. He discussed how sandblasting as a means of surface preparation can be made economical, and produce an excellent surface for coating application.

He also discussed other means of surface preparation. Good surface preparation, in conjunction with proper coating selection, and quality application will result in the most economic coating system measured in dollars per square foot per year, the only true basis on which to evaluate the cost of coatings, he concluded.

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U B S Polymer Plant

A new polymer plant, recently constructed in Lemont, Ill. by the U B S Chemical Corp., is now on steam to produce polystyrene based emulsions for the floor finish industry, it has been announced by Roland Avery, plant manager of the Lemont installation.

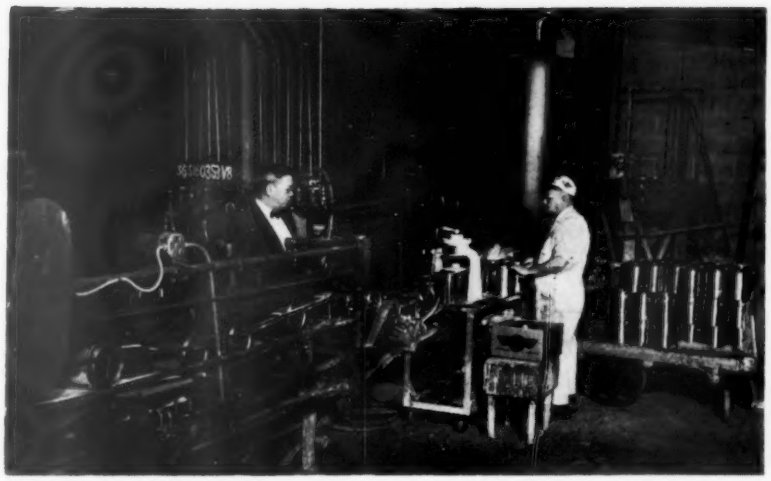
The plant, located just 25 miles outside of Chicago, was completed last January and will concentrate on the production of Ubatol, the trade name for a series of polymer emulsions manufactured by U B S and used by the floor finish trade as intermediates. The new plant will cater primarily to the needs of western and midwestern customers.

•

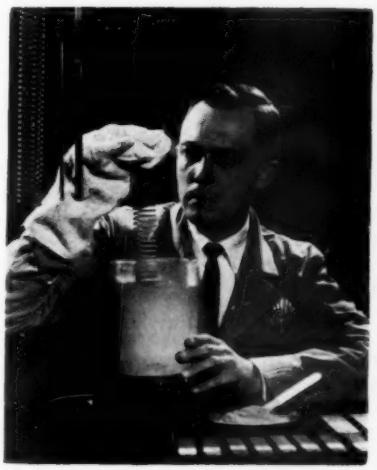
Cargill to Expand

Cargill, Inc. has announced plans for expansion of its grain elevator at Seaford, Del.

This expansion is to increase present barge activity and prepare for possible deep-water traffic.



GOLDEN ANNIVERSARY: Filling operation at the Smith-Alsop Paint and Varnish Co. in Terre Haute, Ind., where the firm is celebrating its 50th anniversary. As the paint flows from the 500-gallon drum, the operator fills double-tite gallon paint cans supplied by American Can Co. Raymond F. Fischer, vice president in charge of production (left), checks on the operation.



POWDERED PAINT: A new method of painting—using dry plant—has been demonstrated by Shell Chemical Corp. Instead of volatile solvents that are normally used to make paint a liquid, the process uses heat and a flow of air. A metal object, like the spring shown above, is heated, then dipped into a container where a powdered paint is kept suspended in a cloud-like consistency by air flowing upward through the container. The heat of the object melts the dry particles of paint that touch it. Further baking smooths the coat of paint and gives high gloss.

NEWS

Rolles Delivers N. Y. Production Club Talk

Rolf Rolles was the featured speaker at a recent meeting of the New York Paint & Varnish Production Club's technical committee.

Mr. Rolles, of the research laboratory of the Aluminum Co. of America, discussed *Leafing, Leaf Deterioration and Leaf Stabilization of Aluminum Paints.*

In his talk, Mr. Rolles pointed out that the major problem of leaf stabilization is to prevent the preferential wetting of the aluminum flake and subsequent removal of the stearate coating by acidic constituents of the vehicle. To date, alkyd vehicles have not been used to as great an extent as they could be because of this effect, which eventually destroys leaf retention of ready mixed aluminum paints based on many of these vehicles.

The result of a basic study of this problem and subsequent investigation of almost two hundred compounds has resulted in the development of an acid acceptor called Stabilizer No. 5. This product not only inhibits loss of leafing of ready mixed alkyd aluminum paints, but also improves their initial leafing, weathering and salt resistance.

Slides where shown, which demonstrated the improved package stability and durability produced by the addition of this stabilizer to ready mixed aluminum paints based on typical alkyd vehicles.

Subsequent discussion brought out the following facts:

(a) The stabilizer does not neutralize the acidity of the vehicle. It merely prevents activity of the free acid.

(b) The stabilizer will not prevent gassing due to moisture in ready mixed aluminum paints.

(c) Concentrations required vary directly with the acid number of the vehicle. The stabilizer is mixed with the vehicle to to tie up the acid before the aluminum is added.

(d) Recommended driers are zirconium plus cobalt and/or manganese.

ACQUISITION BY RCI: Dr. Adolph Heck (standing), founder and president of Alkydol Laboratories, Inc., with Henry Reichhold, founder and president of Reichhold Chemicals, Inc., during discussions of the purchase of Alkydol by RCI. On the desk is a decorative laminate made with a synthetic resin produced by Alkydol. Acquisition of the Chicago firm, which will continue to be headed by Dr. Heck, was finalized on April 20.

•

Allied Chemical Addition

Completion of new phthalate ester plasticizer facilities at Allied Chemical Corporation's Toledo, Ohio plant has been announced by T. J. Kinsella, president of Allied's Plastics and Coal Chemicals Division.

According to Mr. Kinsella, Allied Chemical, long a major supplier to the vinyl industry, now offers its customers a single basic source with varied plant and distributing locations capable of supplying its line of plasticizers. The new Toledo facilities will serve the midwest by direct bulk and drum shipments as well as through six bulk stations located in major cities.

•

Arizona Plans Refinery

Arizona Chemical Co. has completed plans for the construction of a tall oil refinery to be located in Springhill, La.

The new facility will enable Arizona to process annually an additional 40,000 tons of crude tall oil, a sulfate paper industry by-product which it will obtain from nearby International Paper Co.

Arizona will produce Acintol brand rosin for the paper industry and high grade fatty acids used in the manufacture of paints, varnishes and lacquers, and other industrial products.

•

Aerosol-Dispensed Multi-Color Paint

The development of a successfully packaged aerosol-dispensed multi-color paint, called MorFlek Spray Finish, has been announced by Benjamin Moore & Co.

The Moore color line will consist of the same 14 pastels now available in MorFlek, which the company packages for application with standard spray equipment. Like its counterpart, MorFlek, the new product is a rubberized vinyl coating that is fully washable and easy to maintain. The absence of lacquer solvents minimizes the danger of lifting previously painted undersurfaces, make application pleasant and reduces fire hazard. It dries quickly to a smooth, nontextured eggshell flat finish that can be satisfactorily recoated in a solid color.

MorFlek Spray Finish is not to be confused with so-called spatter paints, but is a true multicolor paint with two, three or four colors being sprayed simultaneously from the same can. It is said to a hard, tough, elastic film which resists abrasion, scratches and chipping, and possesses the durability of several coats of ordinary paint.

PERSONNEL CHANGES

MINERALS & CHEMICALS

O. W. Callighan has been appointed to the new position of director of customer relations and **Homer A. Smith** has become assistant manager of chemical distributor operations, it has been announced.

O. W. Callighan

H. A. Smith

Mr. Callighan joined the company in 1927, after completing courses in pulp and paper technology at the University of Maine and in paper making at the Institute of Industrial Arts at Gardenvale, Quebec. Mr. Callighan also spent three years with the Allied Paper Mills in Kalamazoo, Michigan as a chemist.

In his new position, Mr. Smith will assist in directing the operations of 30 distributors in the United States, Canada and Mexico. He has been associated with the company since 1949 and prior to his new appointment was a distributor field representative.

Mr. Smith holds a Bachelor of Science degree in Chemical Engineering from Rice Institute.

GEORGIA MARBLE

The following changes have been announced:

Joseph C. Nelson, Jr. has been appointed assistant sales manager; **James R. Thornwell** and **Thomas E. Evans** have become sales representatives; and **Al Boehmer, Jr.** has resigned as sales representative.

Mr. Nelson attended Davidson College and has been working as sales representative for calcium products division since 1955.

Mr. Thornwell is a graduate of Vanderbilt University with a B.A. degree in Business Administration and has worked since 1957 in the calcium products division laboratory.

Mr. Evans is a graduate of the University of Chattanooga with a B.A. degree in Geology and has worked in the firm's geology department.

Mr. Boehmer is leaving the company to return to the paint business in Orlando, Florida.

INTERCHEMICAL

Daniel Smith has been appointed director of the IC Color Center, it has been announced. Mr. Smith succeeds **F. L. Wurzburg, Jr.,** who is returning to the printing ink division.

Mr. Wurzburg, a graduate of Yale University, has been with the firm since 1933. Recognized as a pioneer in color engineering, he has patented a number of inventions, and authored numerous papers on the subjects of color reproduction and color printing.

Mr. Smith, formerly head of the physics department at the Central Research Laboratories, comes into his new position equipped with a wide knowledge of color theory and its applications. A graduate of the Massachusetts Institute of Technology, Mr. Smith has been active in many professional and technical societies concerned with the graphic arts in general and color in particular.

NEVILLE CHEMICAL

E. Glenn Isenberg has been named general sales manager, it has been announced.

Mr. Isenberg takes over the duties of **Alan S. Evans Jr.,** who recently resigned as vice president. Mr. Isenberg

started with the firm 22 years ago in the traffic department. He rose to assistant sales manager and then sales manager.

AMERICAN CYANAMID

Charles E. Lowden has joined the sales staff of the pigments division, it has been announced.

He will be a sales representative in the metropolitan New York area.

Mr. Lowden joined the organization in 1957 as a technical service and sales trainee at the company's Bound Brook, N. J., plant.

He is a graduate of St. Peters College in Jersey City.

COOK PAINT & VARNISH

John S. Ayres has been elected a vice-president, it has been announced.

J. J. Ayres

Mr. Ayres, who formerly served as an assistant vice-president in charge of research in the Detroit factory, will now manage the industrial sales division for the entire company. He succeeds **William H. Hoover** who died last January.

Mr. Ayres attended the University of Missouri from where he was graduated in chemical engineering in 1935. After joining the Kansas City research division in 1936 he did graduate work at the University of Kansas City. He became manager of the Detroit research division shortly after his transfer there in 1940.

HERCULES POWDER

Frank H. Crymes has been named sales manager of the Young development division of the explosives department and **Gilbert E. Cain** has been appointed manager of safety, engineering department, it has been announced.

Mr. Crymes joined the firm in 1939, and has been mainly engaged in sales activities. From 1946 to 1954 he was district sales manager of the company's synthetics department San Francisco district, and from 1954 to 1956 occupied a similar position in Chicago.

In 1956, Mr. Crymes' widespread sales experience led to his being named manager of a sales training program, established jointly by two company operating departments.

Mr. Cain succeeds **Charles L. Jones** who has retired. In addition to his responsibilities for safety in all plants, Mr. Cain will continue the activities begun by Mr. Jones as safety advisor to manufacturers of paint, varnish, and lacquer.

Mr. Cain joined the organization in 1940, and brings to his new post a broad background of experience in plant maintenance and operation, as well as plant safety. He has been assistant to Mr. Jones since 1954.

A graduate of Brown University with a Sc.B. degree, Mr. Cain is a licensed professional engineer.

FEIN'S CAN

Irving L. Holtz has been appointed general manager of sales, it has been announced.

I. L. Holtz

Mr. Holtz, a prominent figure in the can industry, formerly associated with National Can Corp., brings to the firm the background and experience of 30 years in sales and sales management.

Mr. Holtz will direct the sales of the firm and its affiliates from the company's executive offices in Brooklyn, N. Y.

Mr. Holtz is a graduate of both St. Johns University (LL.B.) and St. Lawrence University School of Law (L.L.M.).

GENERAL ELECTRIC

Robert J. Prochaska has been appointed advance development specialist in the company's chemical materials department polycarbonate engineering section at Pittsfield, Mass., it has been announced.

Dr. Prochaska received his A.B. degree from Dartmouth College in 1947 and his M.S. and Ph.D. degrees from Rutgers University in 1950 and 1951.

He joined the firm in 1951 as a development chemist. Subsequent assignments have included technical service, sales and development projects.

Robert T. Daily has been named manager of marketing for the silicone products department, it has been announced. Mr. Daily succeeds Mr. Coe, former manager of marketing, who recently was named department general manager.

Most recently serving as manager of rubber market development for the silicone products department, Mr. Daily has been associated with silicone operations since 1954. He has previously been sales manager for the department's western district. Prior to joining the firm, he was regional sales manager for the Lord Manufacturing Co. of Erie, Pa.

Mr. Daily will continue to be located at the headquarters of the silicone products department. Waterford, N. Y.

June 21-26. ASTM Spring Meeting, Chalfonte-Haddon Hall, Atlantic City.

July 27-31. Gordon Research Conferences, Organic Coatings, Colby Junior College, New London, N. H.

Aug. 10-14. 1959 Short Course on Drying Oils, Sponsored by the American Chemist's Society and the University of Minnesota Institute of Tech., Minneapolis, Minn.

PRODUCTION CLUB MEETINGS

Baltimore, 2nd Friday, Park Plaza Hotel.
Chicago, 1st Monday, Furniture Mart.
C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April Suttmilers.
Columbus — Jan., June, Sept., Fort Hayes Hotel.
Cleveland, 3rd Friday, Cleveland Engineering & Scientific Center.
Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.
Detroit, 4th Tuesday, Rackham Building.
Golden Gate, 3rd Monday, Sabella's Restaurant, San Francisco.
Houston, Monday prior 2nd Tuesday, Rams Club.
Kansas City, 2nd Thursday, Pickwick Hotel.
Los Angeles, 2nd Wednesday, Scully's Cafe.
Louisville, 3rd Wednesday, Seelbach Hotel.
Montreal, 1st Wednesday, Queen's Hotel.
New England, 3rd Thursday, University Club, Boston.
New York, 1st Thursday, Brass Rail, 100 Park Ave.
Northwestern, 1st Friday, St. Paul Town and Country Club.
Pacific Northwest, 3rd Thursday, Washington Athletic Club, Seattle, Wash.
Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.
Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.
Rocky Mountain, 2nd Monday, Republican Club, Denver, Colo.
St. Louis, 3rd Tuesday, Kings-Way Hotel.
Southern, Annual Meetings Only.
Toronto, 3rd Monday, Oak Room, Union Station.
Western New York, 1st Monday, 40-8 Club, Buffalo.

REICHHOLD CHEMICALS

Herbert E. Miegel has been appointed to the newly created post of vice president-engineering, it has been announced.


H. E. Miegel

Previously process manager at the Detroit plant, Mr. Miegel has been with the company for the past 18 years and has been responsible for design and construction phases of many of the firm's plants in the United States and in several other countries.

Mr. Miegel's new duties will include coordination and standardization of engineering practices throughout the company. As of July 1, his office will be at executive headquarters in White Plains.

He holds a Bachelor's degree in Chemical Engineering from the University of Detroit.

GLIDDEN

Paul W. Neidhardt has become general sales manager of the company's paint division, it has been announced.

In his new capacity with the firm, Mr. Neidhardt will assist the general manager in all activities of the paint division, including industrial and trade sales, manufacturing and research. He will be located at paint division headquarters in Cleveland.

A 1937 graduate of the University of Illinois, Mr. Neidhardt has been general trade sales manager of the paint division since 1955. He joined the company in 1951 as merchandising manager, coming to the firm from Meldrum & Fewsmith, Inc., a Cleveland advertising agency.

William D. Kinsell, Jr., has been appointed national trade sales manager for the paint division, it has also been announced.

In this position he will assume full authority for the development of trade sales, including responsibility for advertising, merchandising and promotion of the firm's consumer paint products.

Mr. Kinsell, a graduate of the University of Michigan, joined the company in 1955 as sales promotion manager and was appointed merchandising manager in 1956.

OLD COLONY

E. J. Murphy has been named factory manager, it has been announced.

He will be in charge of factory operations, production planning, and quality control.

Mr. Murphy was the former head of Montgomery Ward's Paint Factory at Chicago Heights, Ill., where he spent the past 20 years as production manager, general superintendent, and factory manager.

Mr. Murphy attended Purdue University where he was an engineering major.

HILTON-DAVIS

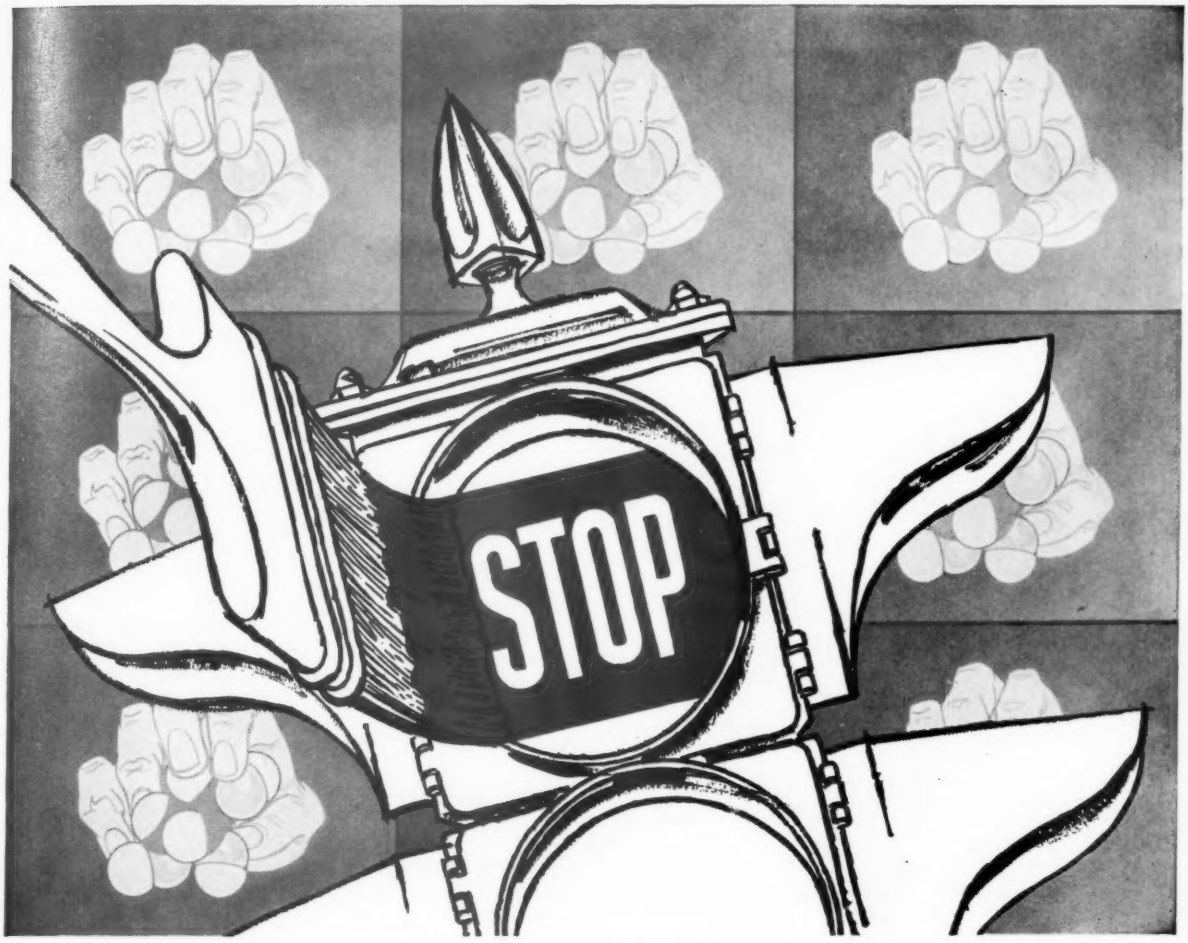
Cline C. Duff has been appointed technical sales representative to the protective coatings industry in California, it has been announced.


C. C. Duff

Mr. Duff will be responsible for the sale of the firm's line of colors in formulating finishes. He will make his head quarters in Los Angeles.

Prior to his present assignment he was assistant to Joseph H. Langner, manager of sales to the paint industry at the Cincinnati plant.

ADVERTISERS' INDEX



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Glycerine has other advantages during alkyd cooking. Its molecule has three OH combining points — two primary, one secondary. In the polymerization reaction, it permits more flexibility and reduces the danger of gelation.

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Properties

HYGROSCOPICITY • STABILITY

SOLVENT POWER • VISCOSITY

NONVOLATILITY • NONTOXICITY

TASTE • COMBINING WEIGHT

Applications

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SOLVENT • LUBRICANT

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ANTI-FREEZE • ALKYD BASE

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TROY

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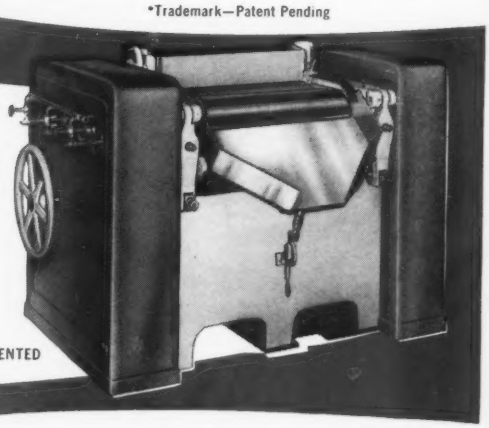
DUPLEX DISPERSER*

Produces Finished Product in One Operation

Compact unit combines powerful disperser head with rugged diamond-shaped agitator to produce finished batches *without further milling* for the majority of inks and paints. Modern design gives proportional hydraulic shear, kinetic impingement and mulling action for better wetting, improved color dispersion, and uniform blending.
Send samples for trial processing.

*Trademark—Patent Pending



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With *One Point* Adjustment "Floating Roll" Principle

For high speed precision-controlled dispersion and grinding of ink, paint, coatings, and similar products. Floating Roll principle minimizes roll deflection, gives maximum grinding surface. Exclusive one-point adjustment speeds clean-up time and provides quick, accurate resetting of rolls.

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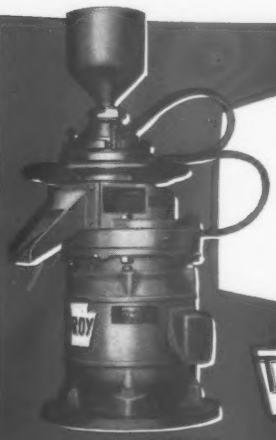

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Utilizes three zones of action — at upper face of rotor, between peripheral surface of rotor and housing, and between under face of rotor and housing — for better emulsions and finer dispersions. Unit design prevents aeration of materials. Clearances adjustable while unit is in operation by calibrated adjusting ring.

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